

# The Mining Journal

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Railway & Commercial Gazette

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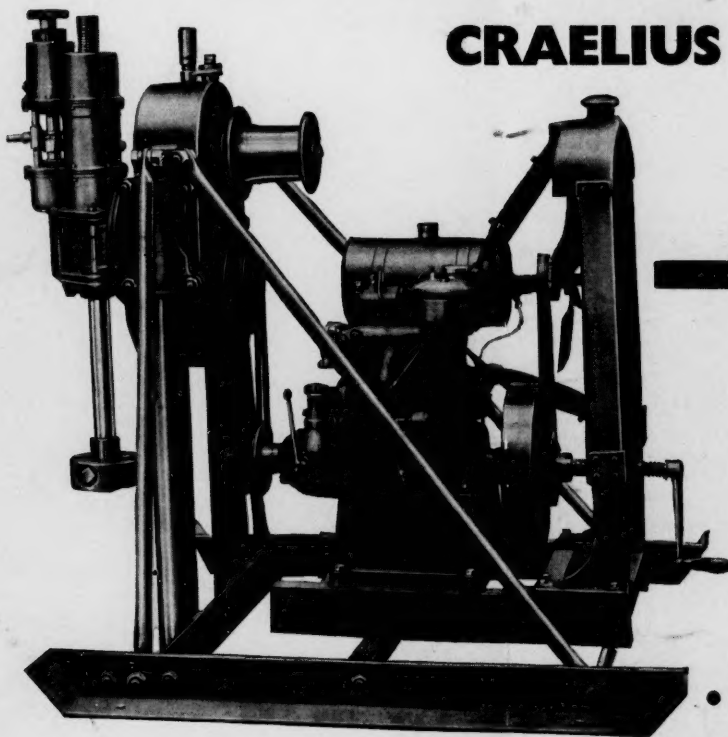
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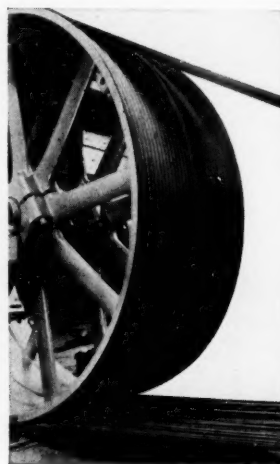
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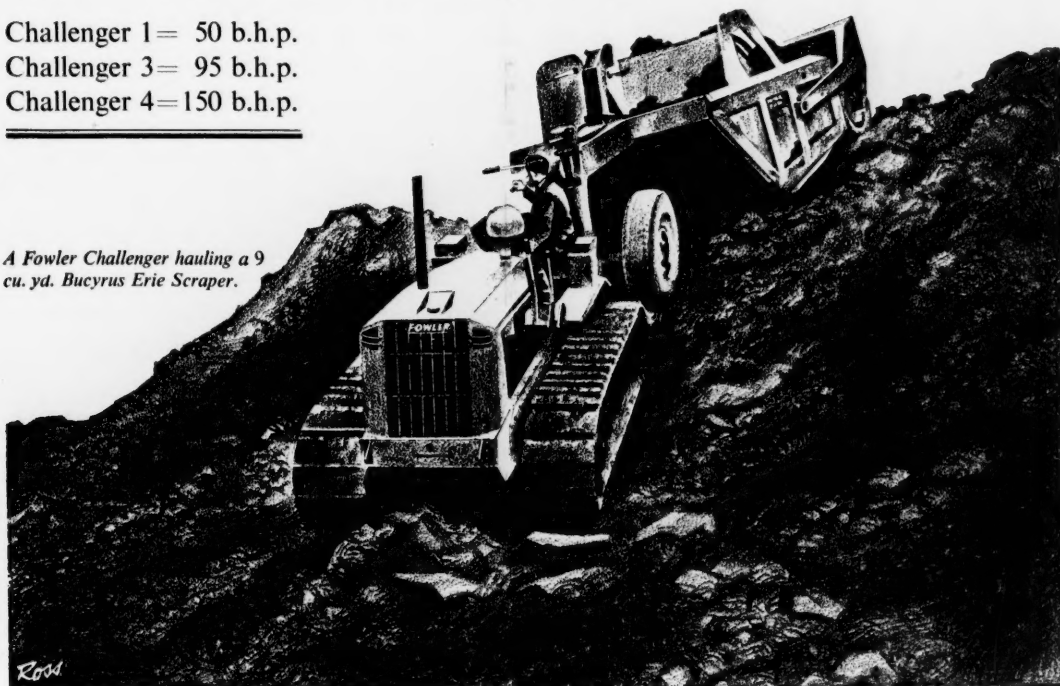
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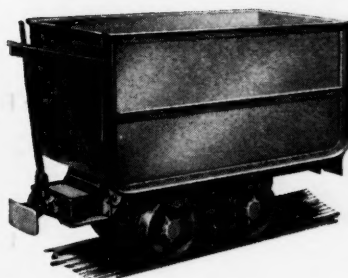
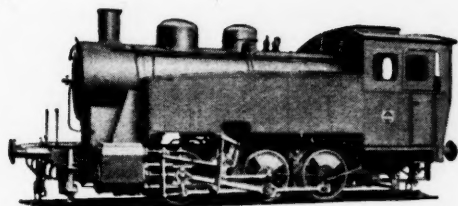
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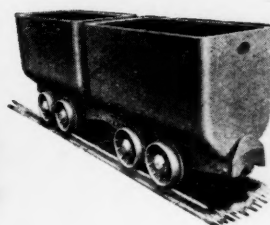
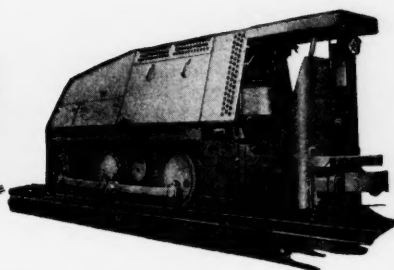
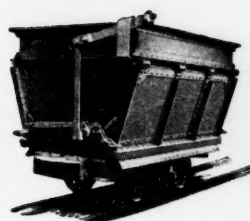
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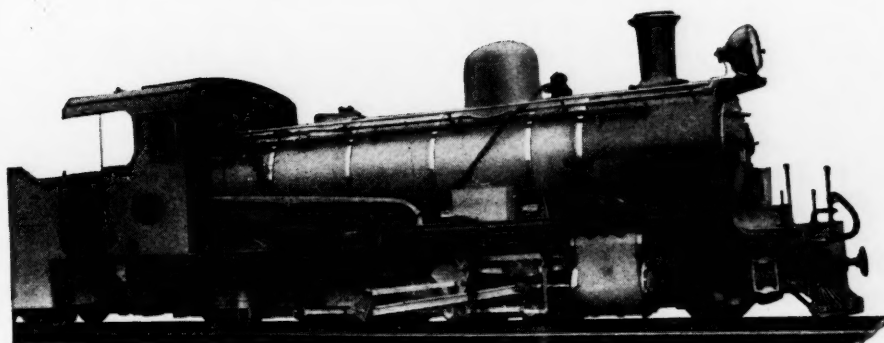
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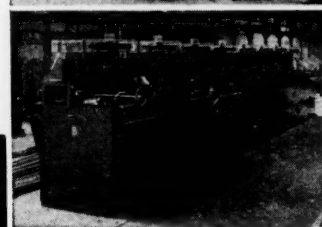
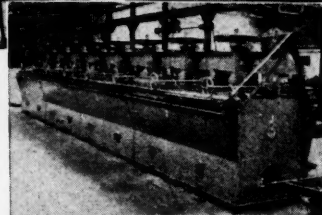
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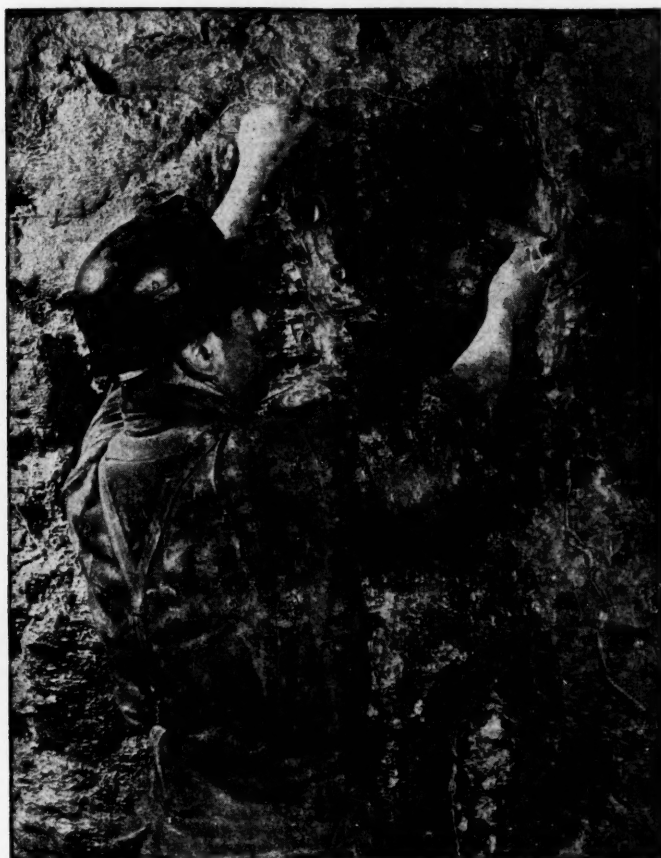
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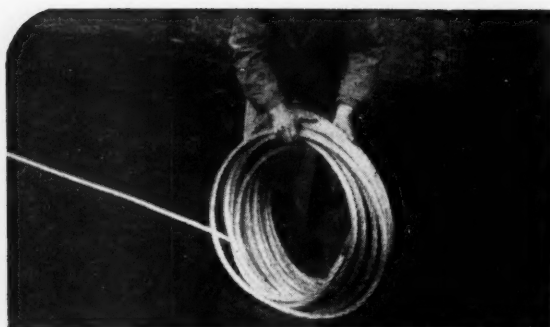
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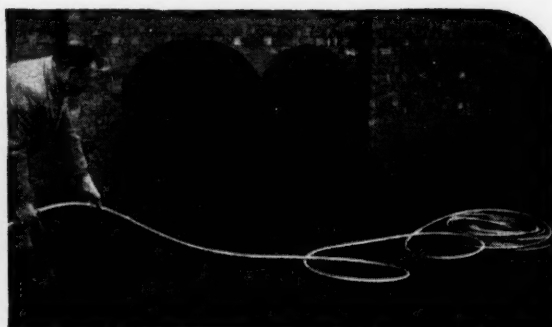
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IF ROPE COULD TALK . . .

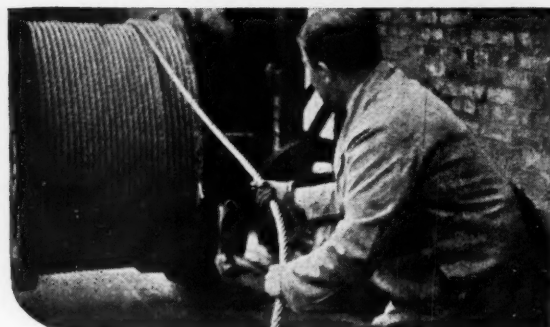
## “I’m mighty like a hose!”



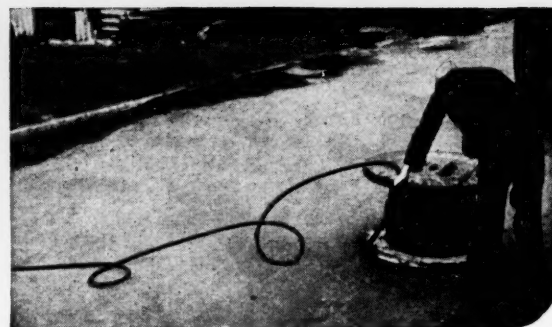
Uncoiling. The right way, treated like a hose



—and the wrong way



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—and the wrong way

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# The Mining Journal

Established 1835

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## NOTES AND COMMENTS

### The Portent of British Guiana

Disturbance to the mining industry seems to be threatened in a new quarter, to judge by news releases regarding the situation in British Guiana. If the position there is not so serious as some reports have suggested, the somewhat tortuous and evasive statements which have emanated from Colonial Office and Admiralty sources recently are largely responsible for the confusion. Anyway there is a considerable movement of the Navy towards the Colony and apparently rapid embarkation of troops from Jamaica and possibly from home. The reason for all this excitement appears to be the activities of the Premier, Dr. Jagan, his wife, and various members of his cabinet whose earlier contacts with the Russian Communist organization have been further emphasized by visits to Communist-sponsored meetings in Europe during the past summer. It will be recalled that Dr. Jagan's party, the P.P.P. (People's Progressive Party), were victorious in every constituency in the May elections, a uniformity which is only usual in countries under Soviet rule, and is suggestive of a similar technique. The world has become suspicious of 100 per cent plebiscites.

The population of British Guiana in the 1951 census was 437,022, of which East Indians, including some Chinese, numbered 197,696, or something slightly over 40 per cent. This section of the population consists largely of descendants of the Indian indentured labour introduced into the Colony towards the end of last century to work in the sugar plantations. The bulk of the remaining population is mainly negro descended in most cases from the African slaves so largely represented in the West Indies generally. The aboriginal Indians are believed to number only about 16,000.

British Guiana has had a long mining history and at the beginning of the century hopes were entertained that gold mining and, later, diamond production would grow into important industries, but owing to difficulties of communication with the interior, and the lack of outside capital, the "pork knockers" never succeeded in making the hoped-for recovery and production has on the whole been on a declining scale. Output for the first six months of this year, according to the report of the Commissioner of Lands and Mines, was only 8,241 oz. gold as compared with

8,853 oz. in the same period last year, and of diamonds 17,638 ct., against 18,522 ct. for the first half of 1952.

Meanwhile following the conclusion of the first world war, bauxite mining has gradually developed until British Guiana became a few years ago the world's largest producer, only to be surpassed by the adjoining colony of Dutch Guiana (Surinam), both under the impulse of North American capital. Out of a world total output of nearly 13,000,000 tonnes last year, Surinam produced 3,153,790 tonnes and British Guiana 2,426,264. British Guiana bauxite mining is carried on by the Demerara Bauxite Company. This concern, which forms part of the Aluminium Ltd. group, supplies at present the bulk of the bauxite for the Canadian smelters, but the group is also developing deposits in Jamaica and the Los Islands off the coast of French Guiana near Konakry. Should Dr. Jagan and his cabinet succeed in fomenting serious strikes among the bauxite workers, as they have sought to do in the sugar industry, supplies to Arvida and Isle Maligne may eventually be curtailed, but the company no doubt carries large reserves and its operations would probably be unaffected unless strikes were widespread and prolonged.

Naturally the question suggests itself how far Communist influence has achieved similar penetration in Surinam from which aluminium producers in the United States draw largely for their supply of bauxite. Nor must it be forgotten that there is always a considerable migrant population owing allegiance to no particular State on the borders of Venezuela, British Guiana, Surinam, Brazil and French Guiana all at hand and liable to take advantage of disturbances.

How serious the situation in British Guiana may be or what support Dr. Jagan can count on from the great bulk of the population we have no means of knowing, but it is of course obvious here as in some others of our tropical colonies that the policy of granting self-government and universal suffrage to communities entirely inexperienced in such responsibilities and largely illiterate is going to involve difficulties of administration of a serious nature, which do not seem to be fully appreciated, at any rate by the stalwarts of the Socialist Party in this country. The fact that large reinforcements of our military and naval forces are now on their way to the West Indies may scotch the present

revolutionary trend towards complete independence and reliance on the Communist regimes of the Kremlin and Peking, and should be successful in maintaining order in the West Indies generally, but without rapid development of industrial progress and increase in settled employment and improvement in the standard of living this will not, in the long run, be sufficient, and recent developments in British Guiana serve as a reminder of the possibilities for mischief of Soviet infiltration among impoverished and emotional communities.

#### U.K. Imports of Australian Uranium

There are hopes that imports of Australian uranium to the United Kingdom may be increased in the near future. This hope is based on the discovery of further deposits since the conclusion of the original agreement between the Australian Government and the American Atomic Energy Commission. This agreement was signed in Washington early this year, and by it the United States and Britain, through the Combined Development Agency, contracted to lend Australia funds to develop the Rum Jungle uranium fields while simultaneously Australia made its surplus uranium available to the two purchasing nations. Writing at the end of July our Australian correspondent said that from the date of signature (January 8) until that time, the United States and Britain had advanced approximately £1,100,000. It is believed that in about nine months from now sales of uranium will be sufficient to provide for further development. The contract with the C.D.A. will continue for seven years, using as sources of supply Rum Jungle in Northern Territory, and Radium Hill in South Australia.

The suggestion of stepping up uranium deliveries to this country will be raised by Lord Cherwell, the paymaster general and chief scientific adviser to the Cabinet, who is at present in Australia. During his visit he will make a survey—under strict security conditions—of uranium resources and production. This survey will take into account the recent discoveries, and will seek to assess the grades of uranium ore being produced in Australia. Any increased imports to the United Kingdom will be provided solely from the recently discovered deposits, the disposal of which is not covered by the existing contract.

The efforts of the United Kingdom may, however, be affected by previous commitments to the United States. It has been pointed out in Australian circles that long term contractual obligations to this country could conceivably result in a future reduction of supplies to the U.S., and it may be that the Australian Government might decide upon a future policy of working on a day to day basis to provide sufficient uranium for both Britain and the U.S. rather than consenting to a firm long-term contract with Britain.

In the meantime, secret talks at the highest level are currently being held in Australia as a preliminary to the Government's conference with Lord Cherwell. It is understood that the increase of the stockpile of Australian uranium held for local use, particularly in South Australia, has been discussed and that agreement has been reached between the Government and the States concerned on the subject of uranium sales. If these can be satisfactorily expanded they will allow sufficient uranium to be reserved for research and eventual industrial use in Australia, with the balance of additional output being made available for sale to the Combined Development Agency. In fact, a main objective from Australia's standpoint is to ensure these supplies of uranium for industrial purposes, apart from that being supplied for defence needs.

Writing as recently as last week our correspondent reported that Government geological work is steadily extending the region of the Northern Territory favourable to the occurrence of uranium ores. However, he points out

that exploitation of commercially important uranium deposits is not confined to Government activity alone. A stimulus to activity is a statement by the Commonwealth Government that private miners and mining companies may apply for uranium mining leases. Under the terms of the leases all ore mined must be sold to the Commonwealth Government and the improvement clauses of the leases must be strictly complied with. The scale of payments has been fixed. Prospecting authorities may also be issued by the Government to private persons, with the sole right to prospect on Crown Lands. Originally, prospecting and mining of uranium were vested solely in the Government.

The new provisions have already led to the formation of companies to explore for uranium, and others are proposed. Large organizations such as Gold Mines of Australia and Western Mining Corporation have announced their intention to acquire uranium prospects warranting investigation. A recent discovery of uranium has been made at Coronation Hill, in the Northern Territory, 40 miles east of Pine Creek, and a later discovery has been reported 70 miles to the south, which has considerably widened the area of possible uranium-bearing country.

The South Australian Government's project is steadily taking shape. The mine is at Radium Hill, near the New South Wales border. It is stated that the estimated cost for the completion of the work for initial production will be £A5,000,000. It appears to some that provision for opening up and equipment is on the elaborate side; for instance, it is reported that the main shaft is 16 ft. by 12 ft. in section which would serve mines with very large lodes and big output. This shaft has now reached a depth of 400 ft.; two levels have been opened out and a third is to be started. The ore will be concentrated at the mine and the concentrate railed to the treatment plant now in course of erection at Port Pirie. The estimated cost of this plant is £A1,500,000. Treatment is expected to be commenced in May next year.

#### The American Mining Congress, 1953

Approximately 2,000 members and non-members attended the 1953 metal and non-metallic convention of the American Mining Congress at Seattle, Washington, from September 21 to 24. Economic sessions of the convention covered such subjects as tariff, taxation, public land policy, labour relations, manpower and monetary problems, while the technological meetings discussed mechanization, open pit developments, milling metallurgy, prospecting and kindred subjects.

Our United States correspondent, who attended the convention, reports that much of the discussion on tariffs was connected with the lead and zinc industry, and it would be misleading to suggest that all speakers demanded increases. Indeed, Mr. Felix Wormser, who left the post of vice-president of the St. Joseph head company to serve as Assistant Secretary of the Interior, warned the convention against restrictive trade agreements or the establishment of a policy that would tend towards international trade barriers, while Mr. J. A. Costello, vice-president of the Ethyl Corporation, advanced a policy of caution in the consideration of a lead tariff which might be oppressive to any segment of the industry. A further cautionary note was struck by Dr. G. C. Monture, of the Canadian Department of Mines and Technical Surveys, who said that an unwise tariff on lead and zinc could render it impossible for Canada to trade with the U.S. in these metals.

At the panel on gold, silver, and monetary problems Mr. V. C. Wansbrough, of the Canadian Metal Mining Association, briefly outlined the efforts made by the Canadian Government to support the gold mining industry by the cost-aid programme, and presented cogent arguments for free trade in gold. He suggested that an increase in price would tend to stabilize international trade and check inflation. The case for a return to metallic money was



fully discussed, and although Mr. Wansbrough believed that the time is not yet ripe for a return to the full gold coin standard, the Hon. Pat. McCarran, U.S. senator from Nevada, declared that it was fully time—even past the time—when a return to metallic money should be made. The senator was the only speaker on the panel who definitely advocated bi-metallism. In an effort to offer some feasible method of accomplishing this idea, the senator urged that steps be taken to offer redemption of U.S. currency in gold or silver at the option of the tenderer and at prices to be determined by Congress after committee investigation. He emphasized that conversion should not be attempted at an arbitrary price for the monetary metals, but only at such a price as had been determined by investigation to be consistent with existing world conditions.

Dr. D. H. McLaughlin, President of Homestake Mining Company, stated that a point had now been reached where some measure of monetary stability might eventually be obtained by the restoration of the gold standard with the dollar freely convertible at a fixed ratio that *per se* would be neither deflationary nor inflationary. He advocated that restrictions on the ownership of gold by American citizens should be removed, and sale by the Treasury to industrial users at a price of \$35 should be discontinued. Other principal speakers on the Monetary Panel were Mr. M. E. Shoup, President of the Golden Cycle Corporation, and Mr. R. P. Day, President of the Cordillera Corporation, who both advocated a return to a gold standard and convertible currency at a value consistent with world conditions.

## Australia

(From Our Own Correspondent)

Melbourne, September 30.

Oil search and prospecting for uranium\* are leaders of interest in the mining world, closely followed by optimism as to a revival in the gold mining industry. Queensland drilling has receded into the background and the centre of attraction is in the north-west of Western Australia where West Australian Petroleum Pty. Ltd. is actively engaged at Exmouth Gulf. This company is comprised of Ampol Petroleum and California Texas Corporation. Following a widespread examination of the Exmouth Gulf country by British and American oil geologists, the Exmouth Gulf basin has been pronounced on thus by F. A. Morgan "As a potential oil province, I consider the Exmouth Gulf basin one of the most attractive untested areas I know in the world." Some of the structures in the area are regarded as textbook structures. Last year a seismograph survey was commenced by Seismograph Services Ltd., of London, with a party of 22 men, and the Learmouth district in the Exmouth Gulf country was selected for preliminary operations. The party has now moved further north, and actual drilling has commenced. Expenditure to date has reached the sum of £A1,228,000, and it is estimated that additional expenditure to the end of the year will amount to £A675,000. The drilling rig employed is capable of reaching a depth of 15,000 ft., and it is expected that the test hole just commenced will reach a depth of 12,000 ft., the time for completion being estimated at 10 to 12 months.

During this century there has been much work and expenditure in search for oil in Australia by private enterprise and the Commonwealth and State Governments. Some of this work, mainly in the early years by small private companies, has been ill-conceived and the nature of pure wild-catting, but a great amount of carefully planned exploration has been carried out, with, unfortunately,

negative results in the way of discovery, but positive results in the exclusion of areas of country initially regarded as possible oil regions. This patient work, hitherto one of elimination, has now restricted potential oil areas to Central Queensland and the north-west of Western Australia. Oil search is a matter of national importance to Australia, where recent years have seen a very great expansion in diesel-generated power in all industries, and most recently in railway work, a trend that must be regarded with alarm in a country devoid—so far—of natural oil supply, but which has large coal reserves.

### ENCOURAGEMENT TO THE GOLD INDUSTRY

Two encouraging factors in regard to gold are the increase in public interest, despite the static price for the metal, and the steady increase in labour offering, a feature that has become very marked in the past six months. There has been an increase in production and in dividends paid. Production for the first six months of the current year has increased by 12.8 per cent over that for the corresponding period of 1952. Dividends for the first seven months of the year, reported by Western Australian mines only, total £A611,962 compared with £A390,025 for the corresponding months of last year. A gratifying feature is that increased gold production has not been attained at the expense of higher grade ore. The ore reserve position has been well maintained by reduction in costs through improved equipment and extended underground mechanization. This position is particularly marked on the Kalgoorlie mines where important reductions have been made; in particular by Lake View and Star, Great Boulder Pty. Gold Mines, Gold Mines of Kalgoorlie, and North Kalgurli (1912).

Great Boulder took the courageous step of erecting its own diesel-electric generating plant; when all units are in operation a very substantial reduction in costs will result. The underground position in this mine is very sound. Gold Mines of Kalgoorlie has good reason to be satisfied with the purchase of the neighbouring Paringa mine, in which substantial tonnages of ore in the known lodes will be very profitable to the Gold Mines of Kalgoorlie company, which has increased its mill throughput to 15,000 tons of ore per month; milling costs have been reduced by 1/6 per ton through alterations. Geological surveys have disclosed a much greater ore potential than had previously been anticipated.

Central Norseman Gold Corporation is steadily assuming greater importance in the Western Mining Corporation group. There is encouraging prospect of the location of a new group of ore shoots in the northern section of the leases. A drill hole below No. 29 level on the Mararoa reef has intersected ore assaying 11½ dwt. gold per ton over a width of 42 in., and in the same area a winze is disclosing intermittent reef with variable values. On No. 34 level, driving is proceeding in a strong reef but with low values at present. These three factors are regarded very favourably. Preparations are in hand to sink the main shaft to a depth of 4,000 ft.

At Great Western Consolidated, at Bullfinch, the grade of ore in the open cut having proved lower than had been anticipated, is causing a difficulty that may take some little time to correct; this correction will result from an increase in the tonnage of underground ore, as preparatory work advances, and from the company's announced policy of commencing work on one or more of its other, and higher grade, properties.

In the Peak Hill district, Anglo Westralian Mining Pty. has commenced work at the old Horseshoe mine, and since June last year has treated 36,000 tons of ore. The orebodies on that field are described as small rich reefs up to 6 ft. in width.

\* Discussed on the opposite page.—Ed. M.J.

## Perlite and its Uses

Although perlite is comparatively widely distributed throughout the world, it is a relative newcomer to the industrial field, with the main deposits worked to the present time being situated in Ireland and the United States. In the following article the author indicates certain of the properties of perlite and describes some of the American mining methods used in its recovery.

In the annual report of the Department of Scientific and Industrial Research for 1949-50, reference was made to the geological information often required by industry on such subjects as the availability of raw materials. As an example of the type of assistance given, it was stated that a firm manufacturing heat and sound insulators had been advised by the Geological Survey on sources of perlite, and had been supplied with samples from localities in Co. Antrim and Arran. The deposits in Co. Antrim proved to be of high quality and their extent was being determined by borings. The report added development plans were being made.

Insulants produced from perlite mined in Northern Ireland are now being developed by the Expanded Mineral Co. Ltd., the basic rock being a type of obsidian with the property of intumescing. The material, which will be marketed under the name of "Brelite," will be available in the form of ceramically bonded bricks, and a light-weight refrigeration slab has also been developed.

The name Perlstein was given by German geologists to certain glassy rocks with numerous concentric cracks, from the fancied resemblance of the broken fragments to pearls. This type of rock has also been described as pearlstone, but the term perlite is now in common use. The properties of perlite are not easily described. When the rock breaks apart, there may be left peculiar glassy balls, more or less rounded and showing concave interstices. These are called marekanite. The cause of the perlite texture is the strain set up in the glass by cooling. The cores of perlite are seldom over an inch in diameter and may be microscopic.

### COMPLEX TECHNICAL DIFFICULTIES

The fact that perlite and certain other volcanic glasses will expand or "pop" when heated to the point of incipient fusion has been known for some time. The expansion is attributed to water contained within the material, which may range from 2 to 5 per cent by weight. Only a small quantity of this water seems to be required for satisfactory expansion. Too much water is reported to cause complete disintegration of some perlites by decrepitation on heating, and one of the problems usually associated with perlite processing is the reduction of the water content to a suitable value before softening the material. This reduction takes place over the range 600 to 1,200 deg. F. The softening range of the glass which forms the major constituent of perlite is very small. The technical difficulties involved in expanding perlite are therefore very complex.

Though perlite is quite widely distributed throughout the world, it is a relative newcomer to the industrial field. A few years ago a considerable number of companies were formed in the United States to quarry and process domestic deposits, but many sources did not come up to expectations and only a very few firms are still producing. Four American producers were visited in 1950 by T. Whitaker, of the Building Research Station, who concluded that the processes then in use might be regarded almost as major pieces of development research based on available laboratory data.\*

The Alexite Engineering Co., of Colorado Springs, was one of the first firms to produce expanded perlite successfully on a commercial basis. The perlite ore was mined by open cast methods at John Clare, near Rosita, Colorado, and was reduced at the mine to the size for kiln treatment. The raw material was fed into rotary kiln furn-

aces, and a flame from natural gas was directed from the feed end to strike the material about 6 ft. down the kiln. The initial 6 ft. length provided a pre-heating zone with a temperature between 800 and 1,000 deg. F. in which the unwanted water was driven off. The temperature in the zone where expansion took place was kept between 1,850 and 1,950 deg. F., depending on the particle size of the raw material. The ore had a bulk density of 68 to 84 lb. per cu. ft. and the product was controlled to give a density between 7 and 15 lb. per cu. ft., depending on the purpose for which it was to be used. From the kiln the expanded material was blown to cyclone collectors, and bagged.

### UNIFORMITY OF PRODUCT

Whitaker also describes the plants and processes operated by the Great Lakes Carbon Co. at Torrance, California, and by the Precast Slab and Tile Co., St. Louis, Mo. He points out that deposits of perlite may contain a number of different types of the ore, each having its own expansion characteristics. To achieve uniformity in the final product the various types may be mined separately, or the mined material may be sorted. Alternatively, if in mining no regard is paid to differences in type and a mixed ore results, the expansion method used must be capable of dealing with a variable input.

The mines operated by Great Lakes Carbon Co. were at Socorro, near Albuquerque, New Mexico, the out-crop being in the form of a stock from which the surface material had been eroded. Excavation was by scraper which dumped the ore into trucks for transport to the preparation plant. Normally the ore was crushed and graded at the mine and transported by rail to the processing plant at Torrance, near Los Angeles, but the plant was equipped for crushing and grading ore not prepared at the mine. The grading and preparation of the ore at the mine introduced difficulties because segregation occurred during transport to the plant, but it enabled the unwanted fines resulting from crushing to be discarded at the mine.

According to Whitaker, perlite ore requires 1,200,000 to 1,800,000 B.Th.U. per ton for expansion, but plant losses are such that the heat input needed is generally about 3,000,000 B.Th.U. per ton. The best perlite expansion plant is reported to use 2,800,000 B.Th.U. per ton, but some plants run as high as 4,000,000 B.Th.U. per ton.

The building industry in the United States is interested in expanded perlite for use as a loose fill and as an aggregate in concrete or plaster when lightness, low thermal conductivity, and/or good fire resistance are important. The manufacturers of "Brelite" are of the opinion, however, that their products will find their greatest field of usefulness in applications where difficulties are normally presented by condensation. The most striking property of perlite from the standpoint of refrigeration is that it is non-hygroscopic.

The Expanded Mineral Co. Ltd. are at present Britain's sole producers of perlite. Hitherto production has been on a pilot plant scale, but commercial production will shortly be started in a new factory at Slough, Bucks.

\*National Building Studies Special Report No. 13, "Lightweight Concrete in America," by T. Whitaker, M.Sc., A.M.I.C.E., A.M.I.Mun.E.

## Fuel Conservation

The recent publication of a Report on Fuel Conservation by the Anglo-American Council on Productivity has once more focused attention on the need for greater economy in the use of coal in Great Britain, particularly in industry. This report, which is the outcome of a visit made by a team of experts to the U.S.A. to study American fuel-using methods, is more forthright in its condemnation of wasteful practices than the one published about a year ago by the Ridley Committee. It appears, writes our coal correspondent, to have created a deeper impression on the general public.

It has been obvious for some time that coal production cannot keep pace with the present rate of increase in consumption and the Council insist that unless effective steps are taken immediately to check avoidable waste of fuel the gap between demand and supply will widen to 30,000,000 tons per annum within the next decade. They believe, however, that it would be possible to save this amount of coal annually now if industrial consumers were to adopt the most up to date methods of utilization. There are no serious difficulties from a technical standpoint but, as pointed out in our issue of October 17, 1952, the modernization of existing boiler plants presents a vast economic problem.

Although coal is the most important single commodity in industry as a whole, it represents only one or two per cent of the total cost of manufacture in the average works or factory and thermal efficiency is, in general, a matter of little importance from the financial standpoint. Therefore power plant engineers are seldom consulted by executives and production managers provided that sufficient power and heat are available to keep the factories going.

### IMPROVEMENT IN THERMAL EFFICIENCY

The Government have already taken steps to improve thermal efficiency in the domestic field by withdrawing the purchase tax on fuel-saving domestic appliances and there are signs that householders are now becoming fully aware of the financial advantages of installing modern types of stoves and water heaters. There appears to be a widespread belief that a similar concession in some form of tax relief to industrial users of coal would result in a large-scale conversion from hand stoking to mechanical stoking of steam boilers, but the cost of a mechanical stoker for a Lancashire boiler with the necessary forced-draught equipment for burning low-grade coal is of the order of £2,000. Since there are about 120,000 such boilers in use the capital outlay would in itself be a great obstacle even if it were possible to manufacture mechanical stokers in sufficient numbers to meet the demand.

The Council suggest that the problem could be solved to a large extent at small cost by educating boiler firemen and raising their status. The low efficiency of the average boiler plant is due in the main to faulty operation and the Report stresses the fact that one unskilful stoker may waste as much coal as a skilled miner can produce. The Council therefore suggest that no person should be allowed to take charge of a steam boiler without some form of statutory qualification within a period of not more than about two years. Special courses of instruction for boiler attendants and firemen have already been established at some technical colleges and the City and Guilds of London Institute will be holding an examination for a boiler operator's certificate throughout the country for the first time in May, 1954.

Many comparisons are drawn in the Report between American and British practices, but it might be considered that some of the strictures passed on the methods used in Great Britain are somewhat unfair when all the circumstances are taken into consideration.

## Atlas Diesel on Show

Some indication of the importance which Britain's competitors in the mining machinery field attach to sterling area markets, and, incidentally, to the world-wide circulation of British technical journals, is provided by the arrangements which Atlas Diesel, the well-known Swedish manufacturers of compressed air drilling equipment, have made to take a party of British technical journalists on a flying visit to Sweden.

The principal purpose of the eight-day trip, which is still in progress as we go to press, is to provide the British technical press with an opportunity for studying the Atlas Diesel range of compressed air equipment—particularly their rock drills and compressors—and subsequently for observing this equipment under actual working conditions in mines and large scale civil engineering projects.

Yet this may be to state the case too simply, for it is essential when referring to Atlas Diesel compressed air equipment to discuss it within the context of the "Swedish method," which the company has developed and which has become a part of currently accepted technique wherever mining and tunnelling operations are carried out.



Some of the party of British technical journalists, who are currently visiting Sweden to study Atlas Diesel equipment in production and on the job, photographed shortly after their arrival in Stockholm in company with J. A. Perham, managing director of Atlas Diesel's British subsidiary company. Among those in the group are Frank Higham (*Mining Magazine*), C. J. Middelup (*Mine and Quarry Engineering*), and our own Assistant Editor, Bruce Dunfield, who is standing immediately on Mr. Perham's right

On Monday, after touring the company's main Swedish factory at Sickla on the outskirts of Stockholm the party went down the experimental mines built under the factories, where Atlas products undergo thorough testing.

Tuesday was devoted to a visit to the Sandvik steel works and Bodäs iron ore mine. Sandvik is one of Sweden's most important iron and steel producing units, and is currently in the midst of completing an expansion programme, the last stage of which will be the installation of a blooming mill scheduled to go into operation next May. This company produces for Atlas Diesel their integral hexagonal and flexible steel with carbide bits and their extension steel for long hole drilling. These are manufactured under the name of Sandvik Coromant drilled steels which play an important part in the Swedish method of rock drilling.

The Bodäs mine, a wholly owned subsidiary of Sandvik, was also visited. Apart from being worked as a normal commercial proposition, this mine also serves as the chief experimental laboratory where Coromant drilled steels are tested under actual working conditions.

The party returns home on Saturday.



# Mobile Mining Plant

By P. STEIN, A.C.S.M.

The use of mobile mining plant is arousing considerable interest in the majority of the world's mining fields, particularly in those under-developed areas where conditions of terrain and lack of efficient overland communication systems render transportation difficult. In the broadest sense, mobile mining plant may be considered under two categories; first, as equipment used in prospecting or early development activities, and second as plant serving a wide area of scattered mining properties. In the following article the author indicates those situations most applicable to the use of mobile mining plant, mentions specific instances where mobile equipment has already proved its worth, and concludes by describing certain mobile units of particular interest.

The full implication behind the phrase "Mobile Mining Plant" is realized when the widely divergent uses of mobile mining equipment are considered. Indeed, the title may embrace any equipment of a mobile nature used within the mining industry, from the small outcrop drilling rig to the motorized first-aid station which serves a group of small holdings.

A more detailed impression of this wide usage may be gained from the following references. An article in *Engineering and Mining Journal* of June, 1947, reported that engineers of the U.S. Bureau of Mines were using a portable headframe to investigate old mine shafts and adjacent accessible workings in the Leadville area of Colorado. The headframe unit was transported by lorry, and a small hand winch raised and lowered the tubular steel tower which folded back over the cab when not in use. Three types of bucket were tested to find the most suitable design for work in shafts as well as man hoisting, the type finally adopted being capable of carrying two men protected by a  $\frac{3}{8}$  in. boiler plate bonnet. This unit was built in a  $1\frac{1}{2}$  ton U.S. Army lorry, and had a hoisting capacity of 3,000 lb. and a drum which carried 1,200 ft. of  $\frac{3}{8}$  in. non-rotating wire rope. The crushing side of mobile mining operations was emphasized in *Imperial Review*, Vol. 14, No. 5, by the description of an all purpose mobile quarry plant which had been put to service in Queensland, Australia. Widely spaced quarries and bad roads had in this instance necessitated the use of mobile equipment, and the resultant unit contained primary and secondary crushing sections and a screening section which could be combined with a portable conveyor and feeder unit. In addition, an article in *The Mining Journal* of November 28, 1952, pointed out that mobile trailer caravan camps constituted a sound investment at the prospecting and early mine development stages. In many countries of the world where mining companies are constantly pushing into little explored territory in search of minerals, it is not surprising that the trailer caravan has made its appearance as survey office, drill shop, or camp unit.

## IMPORTANCE TO LESS CIVILIZED AREAS

The general impression gained from these references is that mobile mining plant seems particularly suited for use in the less civilized areas of the world, while simultaneously it is the smaller operator and not the large, established producer, who normally benefits most.

For the purpose of this article the main applications of mobile mining plant have been classified under four headings:

*First*, in the proving operations where diamond drilling would yield inadequate information; *second*, in the early development of any orebody; *third*, in the exploitation of a small, rich

orebody; and *fourth*, in the exploitation of small mineral reserves in the same region, but where a central treatment plant may not be suitable.

It may be that the first category will be of interest only to the larger mining groups, while the second may apply to both large companies and small groups of operators. On the other hand the latter two situations are peculiar to the small operator.

As an example of proving operations where diamond drilling has yielded inadequate information, the case might be considered where mineralization consists of a dissemination of large particles throughout a lode or host rock. Under these conditions it is often impossible to obtain reliable results as to the true mineral content by diamond drilling. Such a state of affairs probably represents the ideal application for mobile plant, as in the geological occurrence described the simpler sampling techniques will probably also be inadequate, necessitating a bulk sampling operation with pilot milling to obtain reliable results.

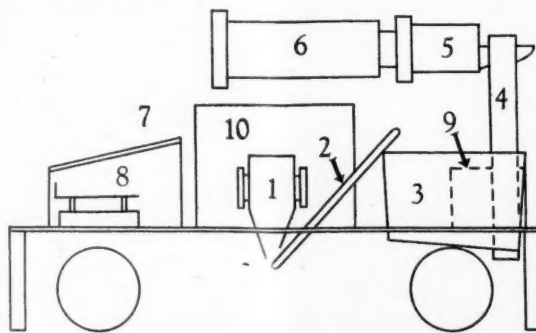
## SURETY AGAINST UNECONOMIC OUTLAY

Once the geologist has recognized the type of mineralization, the mining company must move in the required plant and materials to set up the pilot mill together with the auxiliary services which supply the pilot mill. Yet should the ensuing development and piloting reveal the orebody to be uneconomic, all the financial outlay on buildings, foundations, fixtures, erection and dismantling will be a loss. With fully mobile equipment these costs would be much reduced as, although the initial expenditure on mobile plant is likely to be higher than that paid out on static units it is logical to expect that transportation charges will be lower when units are able to move under their own power.

In the early development of an ore body, it has always been the case that new mineral reserves are likely to be discovered in areas remote from ports and normal transportation facilities. The situation is given added moment by the increasingly efficient and more widespread use of modern prospecting equipment—often in conjunction with helicopters—which enables vast areas to be prospected in the minimum of time. As a result of the distances covered by prospecting teams which result in far flung ore bodies being reported, there is likely to be an excessive delay

between the initial decision to develop a mine and the actual commencement of the operation. In a case such as this, the use of suitable mobile plant may save months that otherwise would be wasted and even in the extreme instance where supplies and equipment must be transported by air, it is still possible that greater flexibility will be derived from such plant.

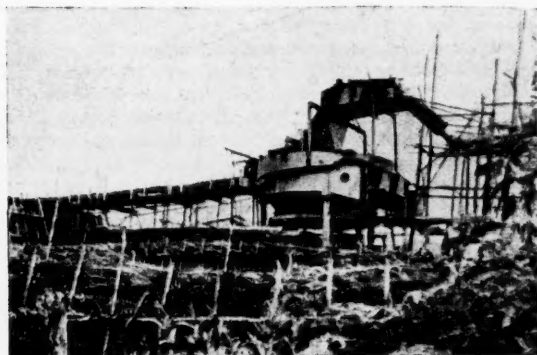
Yet it is to the smaller operator that mobile plant may be of most particular



Left hand elevation of the Austral Otis mobile gold battery referred to on the opposite page



benefit. Operations in the exploitation of small rich ore bodies and of series of small mineral deposits in localized regions where centralized treatment plant may not be feasible, are already being carried out in the United States, Australia and Southern Rhodesia. In these countries, enlightened Government is encouraging small scale mining and almost any area in which numerous small scale operators are working could benefit from the



A portable jig used for concentrating tin ore in Indonesia

availability of suitable portable plant. This plant could possibly be operated on a custom basis by either a private individual or company, or by a Mines Department. It might conceivably be group-owned by the small operators themselves.

#### UNITS OF MOBILE PLANT

An example of the practical application of mobile equipment in overseas areas is the use of the portable gold battery built to assume some of the duties of 28 static crushing plants in gold mining areas of Victoria, Australia. This unit may be considered as representative of mobile milling plant, in which field there is scope for considerable research and development.

The unit was manufactured by the Austral Otis Company for the Victoria Mines Department and consists of the following sub-units:

An 8 in. by 5 in. roll jaw crusher capable of primary crushing to  $\frac{1}{2}$  in., a Marcy ball mill for final comminution to required fineness, a rotary spiral wire screen, a 5 ft. by 2 ft. 9 in. amalgamating table with the necessary launders to deliver to a No. 5 Wilfley concentrating table, a small amalgamating barrel for cleaning up concentrates, and a 30 h.p. Southern Cross diesel engine. These units are assembled on a 20 ft. by 8 ft. McGrath semi-trailer on double axle capable of carrying an overall load of 8 tons. Hauling is done with a 7-ton Commer prime mover. A 400-gallon water storage tank and centrifugal pump for water storage and circulation are included in the rig.

The method of operation of this unit is shown in the sketch of left hand elevation. Power is supplied by the 30 h.p. diesel engine (10) for the operation of all units through suitable counter shafting and clutches.

The crushed material is carried from the primary crusher (1) by a scraper conveyor (2) to the feed hopper (3), and thence by bucket elevator (4) to the screen (5), and ball mill (6). The pulp is fed from the ball mill through a suitable screen to the amalgamating table (7) and from there is carried over the concentrating table (8), and finally the concentrated product arrives at the amalgam barrel (9). Oversize material from the ball mill is returned by a spiral chute to the conveyor and then back to the feed hopper.

The original plans required a Hardinge ball mill, but on

further investigations this was changed to the present Marcy mill, which is specially designed to pass the whole of the treated material through the mill and erases any necessity for opening up and manual cleaning after a parcel of ore has been treated.

In similar case to the topographical conditions of Victoria, the Lupa goldfield and Karagwe tinfield of Tanganyika are typical instances where a great impact could be made by the availability of mobile equipment and the facilities it offers. A trend in this direction is shown in the Kenya Mines and Geological Report for 1951, where it is stated that individual miners are encouraged to participate in the execution of ore dressing test work in their own areas, this service being provided by the Department.

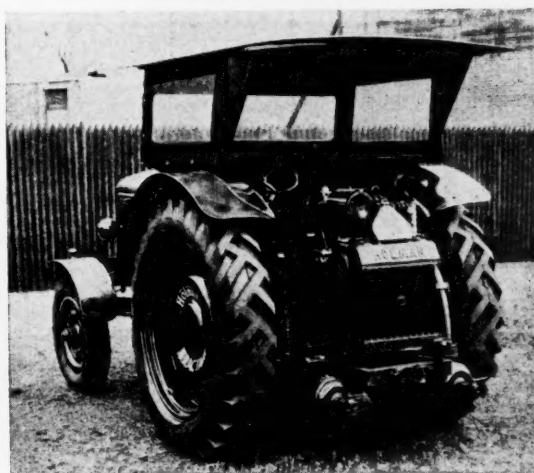
A further example of the use of mobile mining plant is provided by the operation of portable jigs in the Indonesian tin mining industry. In current practice concentration is increasingly effected by these units, and is achieved by lifting the silt intermittently by means of a pulsating water current. At each impulse the grains fall under the influence of their own weight. The heavy tin bearing grains fall more rapidly than the other materials present, and thus only the tin concentrates reach the lower part of the jig. By repeating the process several times, a particularly clean concentrate can ultimately be tapped from the lower portion of the jig.

Whilst a wide range of portable machines exists, it is probable that self-propelled combined tractor compressors, as introduced by Holman Bros. Ltd., would be most suitable as mobile mining plant, particularly if equipped with a trailer, and if possible, capable of higher road speeds.

#### POSSIBILITIES IN THE U.K.

Certain aspects of the treatment of "remnant" mineral deposits in the United Kingdom may be drawn as parallels to the exploitation of smaller overseas deposits.

The Cornish Mining Development Association<sup>2</sup> has drawn attention to a large number of base metal possibili-



The Holman Tractair 8

ties in its sphere of influence. The writer, after some 12 months' exploration work,<sup>3</sup> and a six month economic production programme, estimates that a significant tonnage of uranium scattered over a wide area of West Cornwall could be extracted at a profit, given a fair price by the Ministry of Supply. In addition, there are some hundreds of tons of lead and zinc lying in dumps of Welsh producers; apart from the possibilities outlined in 1952 by

the late R. H. Skelton<sup>4</sup> for lode mining of these metals both in Wales, Cornwall, and other areas of the U.K.

Again in Wales, the Dolgelly copper/gold belt may warrant some further attention; the metallurgical problems that beset operations at the end of the 19th century and indeed even in 1935/37, seem upon investigation capable of solution by modern techniques. It is probable that economic results could be obtained from a vigorous attack on a number of promising prospects from these areas, by a fully equipped mobile mining organization able to deploy its units to a carefully prepared flexible programme. By using such methods, one set of capital plant could be used for all prospects, as against the prohibitive cost of equipping each with its own static plant requirements.

#### LIKELY FUTURE DEVELOPMENTS

Head frame design might well follow the layout adopted by the U.S. Bureau of Mines, and rock breaking and ore transportation equipment is available in great variety, and selection of the lightest types allied to reliability is obvious.

The adaption of mountings for portable crushing, grinding, jigging and tabling equipment should not present

great difficulties, while in similar case flotation cells can, and have been, arranged in portable or semi-portable layouts.

A major problem to be solved if flotation and cyanidation pulps or hydrometallurgical liquors are to be handled, is the provision of reasonable pulp or liquid storage capacity. It would probably be pointless to have vehicle-mounted metal tanks, and a solution may lie in the use of rubber lined inflatable walled containers, constructed after the style of the rescue dinghys used in modern air-sea rescue work. If such a system be practicable the addition of stirring paddles or thickening rakes should present little difficulty. When not in use these tanks could be deflated, and stowed on the parent vehicle. Suitable pumps, classifiers, and screens, as well as the majority of other auxiliaries, are also readily available. The ideal power source is probably a diesel driven generator with individual motors on each item of machinery.

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1. Tanganyika Department of Mines Annual Report, 1951.
2. Special Cornish Mining Development Association publication, 1951.
3. *The Mining Journal*, February 22, 1952.
4. *Mining Magazine*, March and April, 1952.

## American Arc Furnace Practice

Mr. W. B. Wallis, past president of the American Foundrymen's Association, read a paper on *American Arc Furnace Practice* in Sheffield on Wednesday of last week. Summarized extracts are published below. Mr. Wallis is president of the Pittsburgh Lecomelt Furnace Corporation which manufactures the Birlec Lecomelt furnaces under licence. Although this paper is devoted to practice in the American steel industry, the use of Lecomelt furnaces in non-ferrous metallurgy is expanding and much of what Mr. Wallis has to say may be of interest to readers outside the steel industry.

It can be safely said, in so far as the United States is concerned and with the power rates that the American producer has available, that a properly designed top charge electric furnace on basic single slag practice can produce common quality steel from 100 per cent scrap charges at a lower cost than in the open hearth.

#### RIISING ELECTRIC FURNACE PRODUCTION

The largest electric furnace at present in operation in foundry work in the States makes 20 ton heats. The feeling that it is not possible to make large castings with the electric furnace which would compete with basic open hearth castings is gradually breaking down. We look forward to the future, when an installation of two 50 ton electrics will be made in one of our larger foundries. One reason for this change in attitude is that one foundry, having three electric furnaces, by combining heats has been making some of the larger and most difficult castings and showing better results than their competitive open hearth plants.

In the United States the per cent of total production produced in the electric furnace has climbed at a relatively steady rate from 1.8 per cent in 1932 to approximately 7.3 per cent in 1952. Bessemer production has been gradually falling, the electric furnace first passing it in 1948. Present indications are that the electric furnace will continue to widen the margin as time goes on. On the other hand, the open hearth reached its peak in percentage production in 1940 at about 92 per cent, dropping to around 89 per cent in 1952. This means a fall of about 3,000,000 tons.

In comparing the status of the electric furnace percentage-wise, the United States has reached better than 7 per cent of the total production of 1952, whereas Germany has been as high as 11 per cent, Italy has reached 46 per cent and Sweden 41 per cent. Assuming the possibility of developing electric furnace production to a percentage comparable to that obtained in other countries, there is a wide gap to be

filled. Present indications are that the electric furnace has started to replace open hearth capacity. In the first half of 1953, 52 per cent of the electric steel ingots produced in the United States were of common quality steel produced by the single slag basic process. This particular point should always be borne in mind when studying electric furnace data.

I understand that in the United Kingdom there has not, as yet, been developed a single slag basic operation for the production of killed and semi-killed common quality steels. This is common American practice. The United States is producing, in competition with the open hearth furnace, rimmed steels and semi-killed steels, for less money than is possible with, for example, a 250 ton open hearth where 100 per cent scrap charges are made. I believe this practice is peculiar to the United States due to the fact that we are not as yet faced with phosphorus and sulphur problems.

#### GROWING IMPORTANCE OF TOP CHARGE FURNACE

One of the chief factors that has contributed greatly to the increase in electric furnace production was the introduction of the swing aside roof top charge furnace back in 1926. The maximum capacity of the door charge furnace has remained constant at 100 tons since 1927 when a six-electrode furnace was installed at Timken Roller Bearing Company. The top charge furnace increased gradually in size up through 1948, but since the war has risen from 70 tons to 125 tons in 1952 with 150 ton furnaces now under construction.

To-day maximum production is being achieved at many plants. The operations include the manufacture of mild and semi-killed steels (at one plant an average production of 18,000 net tons per month is reported from each 22 ft. furnace), while another installation uses a 20 ft. diameter furnace and achieves a monthly production of 10,608 tons. Recently an open hearth operator making common quality

steels installed an 18 ft. diameter electric furnace and averaged 10,890 net tons in 718 operating hours in the month.

My previous remarks have been concerned with furnaces making common quality steels. In comparison, let us consider the productive capacity of a plant having five 18 ft. diameter top charge equipments. This plant produced 30,100 tons of good ingots during June of this year.

#### REFRACTORIES AND AN INDUCTION STIRRER

Furnaces in the United States are lined, in general, with clay brick on the bottom followed by magnesite brick and then with rammed magnesite mixtures of various trade names with a depth of rammed materials of from 6 in. to 12 in. Other operators put chrome brick next to the shell and then magnesite brick to a total brick depth of 21 in. and on top of this a maximum of 7 in. of Ramset. Side-walls are usually made up of magnesite metalcase brick and are, in the larger furnaces, of 13 in. thickness. Roofs are usually of silica brick although some clay and high temperature refractories such as sillimanite have been used. Where silica is used, some operators prefer 9 in. bricks, others 12 in. bricks with the maximum being 15 in.

An interesting development to steel makers in the United States has been the installation of an induction stirrer on a 20 ft. diameter top charge furnace equipped with a 20,000 kVa. sub-station. This stirrer has now been in operation for nine months, and results indicated the following conclusions: A more homogeneous bath was gained, the shipping yield was showing up 2.5 per cent better on the average and on high nickel steels 15 per cent better, and much lower sulphurs are being obtained than heretofore and have been possible without going to extreme trouble. That is to say, on this furnace numerous heats are made with sulphurs ranging from .005 rising to .01. In comparison, duplicate furnaces without stirrers, on the same practice, were averaging around .015 sulphur. Additional benefits were that more representative samples of the bath were obtained to send to the laboratory, there was a closer temperature and chemical control, and a better ingot surface.

The speed of motion, when the stirrer was first started up, was 4 ft. per sec. across the bottom of the furnace and 2 ft. per sec. at the top of the bath. Since the stirrer has been put into operation, the speeds have been reduced by 2 ft. per sec. across the bottom of the furnace and 1 ft. per sec. at the top of the bath with no change having been noted in the metallurgical results. It is apparent that, tonnage-wise, the electric furnace has just scraped the surface with only 7.3 per cent of the ingot production in the United States.

There has recently been published in the United States by Bituminous Coal Research Inc. a report on the competitive economics of open hearth and electric furnace for the production of low carbon steels. This report, prepared by the Battelle Memorial Institute, shows that in the open hearth process 26 per cent of the heat input is contained in the molten steel; from 20 to 27 per cent is lost in stack gases and 28 to 32 per cent is lost through furnace walls, radiation, and similar factors. For the electric furnace the following table is given:

Heat content in steel	...	...	...	70.5 per cent
Heat content of slag	...	...	...	4.2 per cent
Refining reactions	...	...	...	1.2 per cent
Heat content of waste gases	...	...	...	2.3 per cent
Heat extracted by cooling water	...	...	...	3.8 per cent
Electrical losses	...	...	...	7.6 per cent
Losses through walls, radiation, etc.	...	...	...	10.4 per cent

The economic problem here can be stated simply as the relative cost of the B.T.U. required for each of the two steel production methods. For example, the electric furnace

operation will require roughly 1,700,000 B.T.U. costing \$4-\$5 per ton of common quality steel. On the other hand, the open hearth operator will have to provide some 3,500,000 B.T.U. per ton which may, in some of our steelworks only cost him \$1.75. However, in spite of this differential in the cost of the B.T.U. we are able to show an overall saving with the electric furnace where 100 per cent scrap charges are used.

Another important factor to be borne in mind is the relatively stable cost of electrical energy in the face of steeply rising costs of other fuels such as coal or oil. This is due entirely to the continuous improvements that are being made in electric power station efficiencies. One thing, however, is certain, and that is that there will have to be some hot metal practice developed for the arc furnace if it is to compete, on a cost basis, with the open hearth in integrated works. A further point to consider is that there is an economic limit to 100 per cent scrap charges since there is only so much scrap coming into the market each year.

#### DEVELOPMENT OF LARGE ELECTRIC FURNACES

One of the controlling factors in furnace size is the bad scrap which must be contended with. There are two capacities to an arc furnace; one is the hearth capacity and the other is the volumetric capacity. With scrap weighing 25 lb. to the cu. ft., the volumetric capacity becomes the controlling factor. In the majority of American plants it is necessary to use a minimum of two back charges and in some instances three back charges after the initial charge is melted down.

Broadly speaking, it can be said that for both foundry work and for alloy steel production the electric arc furnace has proved superior to any fuel fired unit both technically and economically. With the common quality steels produced by non-integrated works a good case has been made out for the electric furnace in many instances and fully proved in practice. Yet a modern top charge electric furnace will out-produce by 100 per cent or more an equivalent size open hearth furnace, will handle nearly any kind of scrap, and has a thermal efficiency high enough to more than off-set the lower cost per B.T.U. produced by coal or oil.

The case of fully integrated steelworks is, of course, somewhat different. Here in effect is electricity competing with waste heat and the electric arc furnace will only come into its own when a successful hot metal practice has been developed.

#### THE BRITISH STEEL INDUSTRY

Speaking of the British steel industry the speaker conceded that many of the operating conditions prevalent in the U.K. were different to those of the United States. The U.K. had a phosphorus and sulphur problem to contend with, which was not present in the American industry. Nevertheless, it was his considered opinion that Great Britain, utilizing the grid system, was now in a fair position to consider electric furnaces of much larger capacity than had heretofore been standard in the British steel industry. Birlec now had under construction a 70 ton furnace approximately twice as big in capacity as had heretofore been considered for England and it would be interesting to see the results obtained with this unit.

He felt that the 70 ton furnace was just the beginning in England. In the modern electric furnace, a highly efficient tool for the production of steel has been created, and with the development of practices that must and will go in hand with the development of design, Mr. Wallis looked forward to a continued increase in the percentage of steel economically produced in the electric furnace.

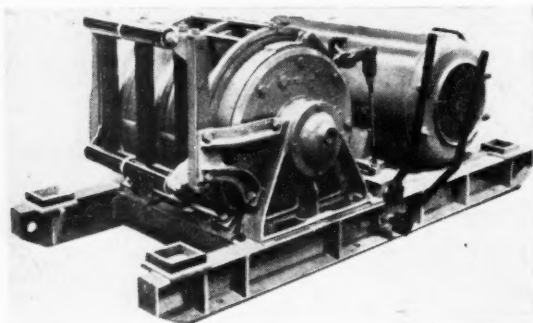


## MACHINERY AND EQUIPMENT

### Mechanized Packing on Longwall Faces

Some of the considerations which dominated the development of scraper packing machinery were the requirement for cheaper and simpler equipment than the pneumatic or hydraulic stowing systems, the need for a method of packing the whole of the face rippings which employed a minimum number of men, the saving of wear on expensive belt conveyors and the disposal of dirt into useful packs rather than into waste or gob. An additional incentive was the need to combine longwall scraper loading and scraper packing by utilization of the same major equipment, merely by changing from the use of one type of bucket to another.

The Joy Slusher type N221 is a double drum, epicyclic geared slusher specifically designed for scraping work. The unit is manufactured by Joy-Sullivan Ltd., and on rope speed of 223 ft./min. has a pull of 3,330 lb. with 25 h.p. motor, 3,996 lb. with 30 h.p. motor, and 4,662 lb. with 35 h.p. motor. With a rope speed of 289 ft./min. the unit provides a rope pull of 2,570 lb. at 25 h.p., 3,087 lb. at 30 h.p. and 3,600 lb. at 35 h.p. Each drum has a diameter of 16½ in., this being the largest size possible consistent with portability, and the rope capacity of each drum is 650 ft. of ½ dia. rope and 450 ft. of ⅝ dia. rope.



The Joy Slusher Type N221

The prime mover can be either electric motor or compressed air driven motor, and the motor is situated behind the drums. Transmission is by a triplex chain, housed in a fabricated steel case and embodying a tensioning device. The unit can be furnished to use by motors of 25 h.p., 30 h.p. or 35 h.p. at 970 r.p.m. and to suit power supply of 3-phase, 50 cycles, and voltages ranging from 380 to 650. These motors are of certified flame proof construction having normal torque, Class A insulation, and shafts mounted on ball and roller bearings. The air driven machine is fitted with a Jay AT .25 Turbinair motor, working on a pressure of 65 lb. per. sq. in., developing 25 h.p. at 1,000 r.p.m.

Two types of bucket are in general use, one type for use in seams of 24 in. thickness and over, the other for use in seams under this dimension. The manufacturers claim that these buckets have an efficient point of balance, with sides so shaped that they do not foul roof supports. Stone is not dragged back with the bucket on reversal. Bucket capacity is stated to be 7.5 cu. ft.

An illustration of operational method may be gained from visualizing a bucket in operation at a typical tailgate in a 3 ft. seam. The bucket fills itself from the pile of dirt under the ripping lip and conveys this dirt along the pack hole. On setting the tail rope in motion the bucket rocks, this action taking place due to the curved shape of the bucket soles, deposits the dirt and returns to the dirt pile. The bucket is then returned to the pack and another load is deposited. After several trips have been made, a pile of stone has been formed.

The bucket is then withdrawn a few feet and is subsequently advanced so that the bulldozer blade packs the stone with a ramming action. Repeated returns by the scraper cause the packs to be consolidated right up to the roof. Any small holes

in the roof, for example those left by bars after removal, are filled solidly and the pack averages 25 per cent more solidity than that achieved by hand packing.

Typical examples of the time factor for stowing ripping dirt are: In a 24 in. seam with 5 ft. advance, two 15 yd. packs were stowed in 2½ hrs.; in a 2 ft. 3 in. seam with 5 ft. advance, two packs totalling 46 yd. were stowed in between 3 to 4 hrs.; and in a seam of 3 ft. 4 in. with 4 ft. 6 in. advance two gate-side packs totalling 23 yd. were stowed in 2½ hrs. Packs of over 100 yd. have been successfully installed by this packing system.

The manufacturers claim that a marked improvement is shown in roadways by use of this process, as conditions remain stable with little distortion. An additional consideration is that the roadhead signalman is under unsupported roof for the minimum of time.

### A Locking Seal on Coal Bunkers

A development of interest to the coal industry is a locked zip-fastener closure on the top feed opening of coal bunkers that prevents dust from escaping while unloading coal from travelling trippers to bunker belt conveyors. Designed by the Stephens-Adamson Manufacturing Co., of America, the closure provides a seal sufficiently tight to confine dust within the bunker, and yet enables the tripper spout to unload along the entire length of the bunker. Applicable to the handling of coals and similar bulk materials, the zip-toothed belt is reported by *Chemical Processing*, to be quiet and automatic in operation.

Named the Zipper Bunker Seal, the closure consists of two belts edged with narrow rubber zipper-toothed strips that interlock with an opening and closing mechanism. The belts, which are flat, are fastened to opposite edges of the bunker opening with their zipper-toothed edges meshing tightly along the centre line to form a dust-proof connection over the bunker feed opening. A metal shield on the tripper chute completes the seal. Grate bars under the seal belt provide protection against accidental injury to operators who might step on or through the belts.

A reversible belt-operating mechanism, equipped with rollers at each end, hangs from the tripper spout to spread the teeth of the zipper for easy opening or closing. Rollers are mounted on pantograph frames to maintain proper belt contact at all times. As the belt is open only directly under the discharge point, dust created within the bunker cannot escape. Additional power required to operate the seal is less than 0.2 for typical tripper speeds.

### A Range of Worm Reducers

The versatile Radicon worm reducers manufactured by companies of the David Brown group are made in a variety of sizes ranging from 1½ in. to 28 in. centres. The 1½ in. and 1½ in. size units, single and double reduction, are made by David Brown (Gears) Ltd., while the larger sizes are produced by David Brown and Sons (Huddersfield) Ltd. Important features of design include the David Brown patent worm thread, production of worm wheel rims in "Taurus" bronze by the centrifugal casting process, scientific cooling and positive lubrication to gears and bearings.

The overall range of standard Radicon reducers comprises units from 1½ in. to 28 in. centres, giving h.p. ratings from 0.03 to 220. Single reduction units, RHU, RHO and RHV offer standard ratios from 5/1 to 60/1, while double reduction units of types RHUD, RHOD and RHVD give increased ratios up to a maximum of 3,600/1 with standard gears. A motorized Radicon, the RMVH, covers the smaller range of ratios.

The units are designed to operate with input speeds up to 1,500 r.p.m. but can be made to operate at speeds considerably in excess of this figure. The smaller units of the overall range, the 1½ in. and 1½ in. sizes, are designed to transmit up to approximately 1 h.p. Suitable for input speeds up to 3,000 r.p.m., output speeds in wide range are given from ratios available from 5.25/1 to 60/1. Developed from the two types is the 1½ double reduction unit, designed to transmit small powers at low output speeds at ratios from 60/1 to 3,600/1.



## METALS, MINERALS AND ALLOYS

Although we are now well into October there is no evidence of the hoped for appearance of the normal autumn buying in the U.S. Generally there is an attitude of suspense in industry due partly, no doubt, to the big issue of international relations the world over and partly to the gradual readjustment of economic conditions after the feverish atmosphere of general panic re-armament associated with the Korean emergency. The longer this suspense continues the more market hesitation is likely to react on metal prices.

**COPPER.**—Copper has been a rather featureless market this week, with prices on the Metal Exchange trending slightly upwards. The same tendency is to be noted also in the United States where smelters are no longer offering metal at 29 c. The reason for this slight price improvement appears to be the strikes and slow downs at Kennecott, Noranda and in Chile, following on the slow down recently at the Garfield refinery and the continued absence of sales of Chilean copper. However, there is no reason to suppose these influences are more than transient, and considered opinion in America seems to be that the price will eventually go lower. Consumers consequently, are reported to be confining purchases to replacement needs.

As regards the negotiations for the purchase of the great Chilean stock by the U.S. no information has been given out despite many constant rumours from Santiago and it is thought that the negotiations may still be protracted. It is reported from the States that much of the Chilean stock has already been stored in the U.S. and it is thought that this may be taken over at current prices leaving the balance, now in Chile, to be priced later. Even if the projected sale of 100,000 tons goes through coming production from the Chilean properties will remain to be disposed of, as and when it is available.

**LEAD.**—Lead has been a steady but very quiet market since our last report. In the U.S. consumer demand has been reported very disappointing especially from storage battery makers and others, and though producers have made fair sized sales, intake of ores and concentrates is larger than the sales. In particular, supplies of scrap lead battery plate are excessive. July imports at 46,500 s.tons were far below the June arrivals although the monthly average for the seven months was above that for last year. Opinion among United States producers regarding the best form of protection against foreign imports shows no signs of agreement on the right measures. The U.S. National Lead and Zinc Committee has now rejected its easier idea of quota protection and would like to see a sliding scale tax as proposed by the House Ways and Means Committee.

The A. S. and R. have closed down their old Morning lead-zinc-silver mine in the Coeur D'Alene, continuously worked for 70 years.

**TIN.**—The general tin position is unchanged with prices barely steady. In the United States the projected International Longshoremen's strike has been interrupted by the President's decision to impose an injunction under the Taft-Hartley Act. The first stage is a temporary injunction up to October 15, leaving it open to the Government to apply for a permanent injunction presumably for the 80 days' "cooling off" period provided by the Labour Act. As a result, tin quotations for spot eased to 82 c. nom. per lb. on Wednesday.

While August production figures were down for Malaya (4,506 tons), Indonesia (2,945) and Belgian Congo (1,057), Straits shipments in September were 4,727 tons distributed as follows: U.S.A. 2,065, Continent 1,078, British Possessions 604, U.K. 361 and miscellaneous 619. Exports from Bolivia in July were again very heavy at 4,148 tons, bringing the seven months' total to 22,224 tons, the heaviest for a very considerable time. The U.S. Government has now signed the agreement for the purchase of 10,000 tons of Bolivian tin, to which the Bolivian Government had previously acceded.

The Chairman of the London Tin Corporation, Mr. J. Ivan Spens, at the annual meeting of the Corporation this week, reported elsewhere in this issue, gave a comprehensive review of the company's subsidiaries in Malaya, Siam, Burma, and Nigeria, stressing what is so often forgotten in Government circles, the necessity of retaining ample funds to meet transfers

of dredges to new properties as the old paddocks get worked out. He reported that in Nigeria the grade of ground is declining as well as becoming more difficult to work and this description is even more widely applicable.

The International Tin Study Bulletin reports the world output of tinsplate in July at 503,000 tons, compared with 548,000 in June, of which the U.S. produced 361,184 tons. The fourth quarter of the year is usually one of reduced activity by the tinsplate mills and the outlook is described as dull but, no doubt, activity will pick up in the New Year. Several U.S. plants have laid off workers.

**ZINC.**—While zinc is fractionally better on the London Metal Exchange than a week ago, in New York Prime Western is now quoted at 9 c. per lb., compared with 9.50 c. previously. Sentiment in the U.S. is depressive and some cuts have been made in mines and smelter output with more in prospect. American Zinc Lead and Smelting Company has decided to cut production at its Fairmont Plant by 25 per cent, representing some 1,800 tons of zinc per month. The Matthiessen and Hegeler Zinc Company is cutting output at its La Salle Smelter in Illinois by one-third, reducing its output from approximately 3,000 to approximately 2,000 s.tons of metal per month. Imports of foreign material into the United States showed a further rise in July to the record figure of 84,717 s.tons: for the first seven months of the year the average net imports were 65,500 s.tons against last year's average of 41,896.

**ALUMINIUM.**—Aluminium Ltd. expects to turn out 489,700 tonnes of aluminium this year compared with 454,400 in 1952, allocated as follows: U.S. 206,900, U.K. 166,800, Canada 80,000, other markets 36,000. Alcoa has had to shut down four pot lines at its Tennessee branch owing to water shortage but seven pot lines will be maintained in operation; until rains restore the level of the lakes sufficiently to ensure continuous operation, the four lines will remain closed, reducing the monthly output by some 5,000 s.tons. The Kaiser Bauxite Company has suspended shipments of Jamaican material to its Baton Rouge Plant in Louisiana while a major reconstruction programme is carried out; this may be completed towards the end of November. The Reynolds Mining Corporation has begun development of its bauxite reserves in Haiti with an eventual estimated cost of \$7,000,000. The principal deposits are situated near the port of Miragoane, 80 miles from Port-au-Prince, and were discovered some years ago before the 1944 agreement for their exploitation was made with the Government. Initially, the undertaking will be on a smaller scale than the Reynolds plant in Jamaica, but capable of being rapidly expanded.

The discovery of bauxite deposits in Arnhem Land, Northern Territory of Australia, more particularly in Marchambar Island just off the coast, is reported from Sydney. The Australian Aluminium Production Commission estimates the presence of 10,000,000 tons of bauxite, going 47 per cent aluminium and the deposit can be worked opencast. The Commission is only awaiting Government approval to start work.

**MAGNESIUM.**—In the U.K. the Minister of Materials has decided to restore private trading in magnesium as from January 1, 1954. As from that date, the Ministry will cease to trade in magnesium and the Magnesium Distribution Order, 1951, will be revoked. Private imports will be permitted and applications for import licences should be addressed to the Import Licensing Branch, Board of Trade.

The production of magnesite in the United States decreased by 24 per cent last year to 463,342 tonnes. World production, however, is estimated by the U.S. Bureau of Mines as practically unchanged from 1951 at 3,800,000 tonnes. Austrian production continued to increase rapidly and totalled 742,259 tonnes. Production by Greece is also steadily rising and reached 81,591 tonnes last year. These three countries were the principal world producers.

**TUNGSTEN.**—There is no change to note in the home market for tungsten ores which remains very dead. Imports

into the U.S. in the first six months of the year are reported as 14,575 s.tons of 60 per cent concentrate. In the second quarter Korea supplied 936 tons (tungsten content), Brazil 380, Thailand 363, Burma 327, Spain 290, Portugal 273, Bolivia 262, Canada 190, Australia 176, and Argentina 143 s.tons of contained tungsten. The U.S. domestic output in the first half of the year was 4,375 s.tons of 60 per cent concentrate.

## Iron and Steel

A renewal of activity in the iron and steel market has fortified the belief that a busy winter for the industry is assured. The brief lull recently experienced was generally attributed to the desire of consumers to reduce their stocks to normal proportions. Now that supplies are more readily obtainable, it is no longer necessary to carry big reserve stocks. But consumer demand is very substantial. Possibly it is ahead or at least abreast of production and orders are now coming in quite freely for deliveries up to the end of the year. Add to this the now favourable prospects in the iron and steel export trade and there is ample justification for the further expansion of production which means the completion of the first five year development plan and the beginning of the second.

One of the difficulties which has halted the rising trend of pig iron production has been the scarcity of coke. To some extent this shortage will be relieved by the lighting this week of a new battery of 26 ovens at the West Hartlepool works of the South Durham group. Completion of a second battery of similar size with a capacity of 2,000 tons a week is promised next year. This should help to swell the output of pig iron which is barely sufficient for current requirements. Only common foundry iron is at all plentiful and the small surplus of this grade will be speedily absorbed if the call for light castings is increased. An improvement in this direction may be close at hand. A few more orders have been placed and makers of light castings are hopeful that they are nearing the end of the dull patch. Similar indications of better trade are not lacking in the re-rolling industry. It is a good sign that the steel works are disposing of billets more freely and sheet mills are taking up substantial tonnages of sheet bars and slabs. Possibilities of increasing the output of plates in response to the pressing need of the shipbuilding and engineering industries are remote since all the mills are working to the limit of their capacity. But big tonnages of Austrian plates are coming to hand and are heartily welcomed by hard pressed consumers. The activity of the motor trade has been stimulated by the freer availability of sheets and strip, and some useful export orders for black and galvanized sheets have also been booked.

The sharp decline in the imports of foreign scrap has given a further impetus to the demands upon home suppliers and there are few grades of scrap which do not command a ready sale.

## The London Metal Market

(From Our Metal Exchange Correspondent)

The tin market has not shown much animation recently, with only moderate fluctuations from day to day. The Geneva Tin Conference is now reported to be definitely meeting on November 16 to consider a revised draft for an International Tin Agreement put forward by the Drafting Committee of the International Tin Study Group. In the meantime the market is likely to jog along in an uncertain manner until it becomes apparent whether there is any possibility of agreement being reached at the Conference on a proposition for the control of prices and the formation of a buffer stock to be operated by an International Tin Council. The Eastern price on Thursday morning was equivalent to £620½ per ton c.i.f. Europe.

Lead still seems to be in short supply, especially for prompt delivery. Consumer demand is running steadily, and although considerable quantities of metal have been arriving here quite a lot of it is being shipped away, resulting in stocks being none too plentiful.

The chief feature in the zinc market recently has been the appearance of a backwardation which has widened to between £2-£3 per ton. This gives the impression that the low level to which prices have fallen is beginning to restrict production;

in fact it is reported that one of the American zinc producers is cutting its production immediately by one-third.

The U.S. Tariff Commission is to commence public hearings early in November as to whether imports of lead and zinc are damaging to domestic industry.

Copper has been a firm market with a fair enquiry from the Continent. Consumers here do not seem to be well supplied, and the Government Broker has been called upon to furnish moderate quantities. Metal for prompt delivery is somewhat tight, and consumers have had to pay premiums for particular brands and shapes.

Closing prices and turnovers for the week are given in the following table:

	October 1		October 8	
	Buyers	Sellers	Buyers	Sellers
<b>Tin</b>				
Cash .....	£611	£612½	£600	£602½
Three months .....	£602	£603	£592	£593
Settlement .....	£612½		£602½	
Week's turnover .....	310 tons		360 tons	
<b>Lead</b>				
Current month .....	£92½	£92½	£90½	£90½
Three months .....	£89	£89½	£87½	£87½
Week's turnover .....	2,775 tons		3,475 tons	
<b>Zinc</b>				
Current month .....	£70½	£71	£73½	£73½
Three months .....	£68½	£69	£70½	£70½
Week's turnover .....	2,000 tons		3,925 tons	
<b>Copper</b>				
Cash .....	£232½	£237½	£235	£237
Three months .....	£222	£222½	£221	£221½
Settlement .....	£237½		£237	
Week's turnover .....	2,450 tons		2,050 tons	

## OCTOBER 8 PRICES

### COPPER, TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

### ANTIMONY

English (99%) delivered,		
10 cwt. and over .. ..	£225	per ton
Crude (70%) .. ..	£210	per ton
Ore (60% basis) .. ..	20s. — 22s.	nom. per unit, c.i.f.

### NICKEL

99.5% (home trade) .. ..	£483	per ton
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### OTHER METALS

Aluminium, 99.5% ..	£150	per ton	Osmiridium, £40 oz. nom.
Bismuth .. ..			Osmium, £65/70 oz. nom.
(min. 4 cwt. lots) 16s. lb.			Palladium, £7 15s./£8 10s. oz.
Cadmium (Empire), 13s. 10d./			Platinum, £27/£33 5s.
14s. 4d. lb.			Rhodium, £42 10s. oz.
Chromium, 6s. 5d./7s. 6d. lb.			Ruthenium, £25 oz.
Cobalt, 20s. lb.			Quicksilver, £64 15s.
Gold, 248s. f.oz.			ex-warehouse
Iridium, £60 oz. nom.			Selenium, 30s. 6d. nom.
Magnesium, 2s. 10½d. lb.			per lb.
Manganese Metal (96%-98%)			Silver 74d. f.oz. spot and f'd.
£280/£295			Tellurium, 15s./16s. lb.

### ORES, ALLOYS, ETC.

Bismuth .. ..	40% 6s. 3d. lb. c.i.f.	
	30% 5s. 0d. lb. c.i.f.	
<b>Chrome Ore—</b>		
Rhodesian Metallurgical (lumpy)	£14 8s. 0d. per ton c.i.f.	
" " (concentrates)	£14 8s. 0d. per ton c.i.f.	
Refractory	£14 0s. 0d. per ton c.i.f.	
Baluchistan Metallurgical	£15 19s. 6d. per ton c.i.f.	
Magnesite, ground calcined	£26 - £27 d/d	
Magnesite, Raw .. ..	£10 - £11 d/d	
Molybdenite (85% basis)	103s. 10½d. per unit c.i.f.	
Wolfram (65%) .. ..	World buying nom.	
" .. ..	310s. nom. U.K. Selling	
Scheelite .. ..	World buying nom.	
" .. ..	300s. nom. U.K. Selling	
Tungsten Metal Powder ..	24s. 3d. nom. per lb.	
(98% Min. W.)	(home)	
Ferro-tungsten .. ..	20s. nom. per lb. (home)	
Carbide, 4-cwt. lots ..	£35 13s. 9d. d/d per ton	
Ferro-manganese, home ..	£49 15s. 0d. per ton	
Manganese Ore Indian c.i.f. Europe		
(46%-48%) .. ..	7s. 11d. - 8s. 7d. per unit	
Brass Wire .. ..	2s. 5½d. per lb. basis	
Brass Tubes, solid drawn	1s. 10d. per lb. basis	

(By Our Stock Exchange Correspondent)

FINANCE	Price Oct. 7	+ or - on week	O.F.S.	Price Oct. 7	+ or - on week	MISCELLANEOUS GOLD (contd.)	Price Oct. 7	+ or - on week	TIN (Nigerian and Miscellaneous) contd.	Price Oct. 7	+ or - on week
African & European...	5 1/2	+	Freddie's	8/10 1/2	+	St. John d'El Rey	26/6	+6d	Geevor Tin	9/9	+3d
Anglo-American Corp.	17/6	+	Freddie's S.	8/6	+	Zams	29/6XD	+1/-	Gold & Base Metal	3/6	+
Anglo-Transvaal Consol.	20/-	-1/3	F. S. Geduld	2 1/2	-3d	DIAMONDS & PLATINUM			Jantar Nigeria	8/4 1/2	+3d
Central Mining (E1 shrs.)	28/6	+4 1/2	Geoffries	14/6	-5d	Anglo American Inv.	3 1/2		Jos Tin Area	11/3 1/2	
Consolidated Goldfields	49/3	+9d	Harmony	22/9	+9d	Casts	21/6	-9d	Kaduna Prospectors	2/3	
Consol. Mines Selection	24 1/4		Loraine	11/3	-3d	Cons. Diam. of S.W.A.	4 1/2	-1/3	Kaduna Syndicate	7/6	
East Rand Consols.	2 1/2	+	Lydenburg	8/11	-14d	De Beers Defd. Bearer	60/9XD		London Tin	5/3	-1 1/2
General Mining	37/6	+	Mariespruit	14/6	+7 1/2	De Beers Pfd. Bearer	15 1/2	+3d	United Tin	21/10 1/2	+3d
H.E. Prop.	7/6	+3/3	Ofists	34/4	+44d	Pots Platinum	11/-		SILVER, LEAD, ZINC		
Henderson's Transvaal	54/6		President Brand	27/-	-3d	Waterval	53/7 1/2	+1/9	Broken Hill South	2 1/2	+
Johnnies	31/3		President Steyn	22/3	-1 1/2	COPPER	3/10	+9d	Burma Mines	1/6	+1 1/2
Rand Mines	27/6		St. Helena	11/9	-1 1/2	Charnod	5/10		Consol. Zinc	22/9	-7 1/2
Rand Selection	28/-	+1/3	Virginia Ord	17/9	-1 1/2	Esperanza	3/10		Lake George	9/3	
Sirathane Consol.	33 1/4	+1/3	Welkom	3 1/2	+	Indian Copper	3/10		Mount Isa	31/-	-1/-
Union Corp. (2/6 units)	41/10 1/2		Western Holdings	15/10 1/2		Messina	64	+	New Broken Hill	22/-	
Vereeniging Estates			WEST AFRICAN GOLD			Nchanga	15/10 1/2	-6d	North Broken Hill	21/-	-3d
Writs			Amalgamated Basket	1/9	-1 1/2	Rhod. Anglo-American	16/3	+7 1/2	Rhodesian Broken Hill	19/9	
West Wits			Ariston	5/10 1/2	-1 1/2	Rhod. Selection	18		San Francisco Mines	17/9	
			Ashanti	21/-	-1 1/2	Rhokana	20 1/2	-1	Ururwa	2/6	+3d
			Bibiani	3/3	-4 1/2	Rio Tinto	14/4 1/2		MISCELLANEOUS		
			Bremang	2/3		Roan Antelope	30/6	-1 1/2	BASE METALS & COAL		
			G. C. Maitland	3/7 1/2	-3d	Selection Trust	58/3	-7 1/2	Amal. Collieries of S.A.	43/3	
			G. C. Selection Trust	6/-		Tanks	42/6		Associated Manganese	44/-	-6d
			Konongo	1/4		Tharsis Sulphur Br.	23/9		Cape Asbestos	21/3	+1 1/2
			Lyndhurst Deep	1/-		TIN (Eastern)	8/-		C.P. Manganese	52/6XD	+7 1/2
			Marlu	1/4 1/2		Ayer Htam	23/9		Consol. Murchison	20/-	+1/-
			Taqwah & Abosso	3/3		Mahaba	41d		Natal Navigation	31	
			AUSTRALIAN GOLD			Gonggong	8/-		Rhod. Montello	2/6	
			Boulder Perseverance	2/6		Hongkong	15/-		Turner & Newall	59/3	+3/-
			Gold Mines of Kalgoorlie	14/-	+1/-	Ipo	8/10 1/2	-1 1/2	Wankie	12/30X	+7 1/2
			Great Boulder Prop.	9/9		Kamunting	4/6	+3d	Witbank Colliery	3 1/2	
			Lake View and Star	14/-		Kepong Dredging	24/-	+3d	CANADIAN MINES		
			Mount Morgan	17/3		Kinta Tin Mines	24/-	+1 1/2	Dome	\$294XD	-1
			North Kalgurlu	6/6XD		Malayan Dredging	13/10 1/2		Hollinger	\$23	
			Sons of Gwalia	6/-		Pahang	8/-XD		Hudson Bay Mining	\$68	+
			South Kalgurlu	6/9		Pengkalen	10/3	-3d	International Nickel	\$70 1/2	-1
			Western Mining	6/9	+3d	Petaling	8/6		Mining Corp. of Canada	\$33	
			MISCELLANEOUS GOLD			Rambutan	8/16	-1 1/2	Noranda	\$5 1/2	
			Cam and Motor	9/9		Siamese Tin	13/3XD		Queomont	\$5 1/2	
			Champion Reef	5/-		Southern Banta	23/6	+3d	Yukon	3/9XD	-6d
			Falcon Mines	7/3		S. Malayan	8/-	+3d	OIL		
			Globe & Phoenix	24/-		S. Tronoh	10/-		Anglo-Iranian	7 1/8	
			G.F. Rhodesian	5/6		Sungei Kinta	4		Apex	40/7 1/2	+1/10 1/2
			London & Rhodesian	4/9		Tekka Taiping	4/4 1/2	+6d	Attcock	35/-	+1/3
			Moatapa	1/6		Tronoh	22/9		Burmah	54/4 1/2	-7 1/2
			Mysore	1/6		TIN (Nigerian and Miscellaneous)			Canadian Eagle	29/9	+1
			Nundyroog	5/9		Amalgamated Tin	10/4XD	-1 1/2	Mexican Eagle	23/-	+10 1/2
			Oreogum	4/3		Beral Tin	27		Siberian Eagle	41	+
			Oriville	11/9	+3d	Bischof	4/3		Trinidad Lensehold	30/9	+
						British Tin Inv.	12/1 1/2	+1 1/2	T.P.D.	24/-	+2 1/2
						Ex-Lands Nigeria	3/7 1/2		Ultramar	25/9	+



## COMPANY NEWS AND VIEWS

### Shock For Rhodesia Monteleo Shareholders

After the seemingly justifiable optimism, which accompanied the launching of Rhodesia Monteleo Asbestos Ltd. a couple of years back, last week's announcement that the Board had decided to close down the mine and place it on a care and maintenance basis with effect from the end of October must have come as something of a shock to many shareholders. 1952 was a boom year for asbestos in Rhodesia with a record output of nearly 85,000 s.tons of chrysotile (10 per cent increase on the previous year) at an average price of over £78 per ton.

At this writing we have no figures to hand showing the trend of Rhodesian chrysotile exports this year, but the patterns of the Rhodesian and South African markets tend to be very similar and it is notable that exports of chrysotile from the Union were down by over 50 per cent in the first half of the year compared with a year ago. At the same time the average price realized per ton remained substantially unchanged, although this was probably at the expense of raising the average grade of fibre sold. However, since the end of the half year, prices in Southern Africa have slumped heavily, and it could well be that the price, which "Rhomonte" has been getting for the good spinning quality fibres which the mine produces, has fallen by as much as 50 or 60 per cent since the beginning of the year, bringing the revenue per ton substantially below the £175 which was taken as the minimum anticipated average yield in the prospectus.

Some clue to what has been happening may lie in that portion of the Board's statement which refers to adverse market conditions having progressively worsened in Southern Africa in recent months and "in addition to creating difficulties in disposing of outputs" have resulted in prices falling to an uneconomic level. In view of the considerable energy that Canadian exporters have been displaying recently, it may very well be that Rhodesian producers are feeling the effects of more selective buying in Europe (which is their principal market) by consumers who can now afford to be more exacting and, with Canadian dollars now freely available, are consequently showing a preference for Canadian output. This tends to be cleaner and cheaper than Rhodesian and South African production, and in this connection the rather lax quality standards, which some producers in these latter countries were widely accused of maintaining during the height of the boom, may be bringing its own reward. Moreover Russia re-entered the market last year and is believed to be selling competitively in Scandinavia and on a small scale in South America.

Thus it may well be that inability to dispose of current output at present prices, quite as much as any decline in the price itself, may have led to the decision to close down. In any event, this is pre-eminently a situation in which it is to be hoped that the directors of the company will take the earliest opportunity of providing shareholders with fuller information.

### Uruwira's Development Programme Behind Schedule

Uruwira's accounts for the period March 31, 1953, reflect the fall in the lead price experienced during the year. Thus gross revenue, virtually all of which came from the sale of concentrates, totalled £284,468 compared with £451,673 in the previous year, while mining costs and other expenses remained substantially unchanged at £447,292 leaving a debit balance of £162,823 to be transferred to development account. This considerable falling off in revenue has adversely affected the company's plans for financing its current mining and development programme, and the situation is being made worse through deliveries of plant and machinery falling behind schedule coupled with the rising cost of these capital items. Indeed, in his report dated July 3 the general manager states that, of the equipment for the new mill and mine plant on order in the United States and in this country very little has as yet been received at the mine and the directors' report now speaks of early in 1955 as the date when production in the new mill is expected to commence. This is nearly a year later than had originally been envisaged, at the time when the company negotiated with the Mutual Security Agency an agreement whereby the United States would advance \$1,640,000, a loan which was subsequently increased by the provision of £200,000 sterling to permit the transfer to the sterling area of some of the machinery orders placed in the dollar area to offset the rise in costs which occurred during the twelve months following the signing of the agreement.

One way and another, the directors now anticipate that they may be short of as much as another £400,000 to see them through to the bringing of the new mill into the full planned production of 1,000 tons of ore per day. £50,000 of this they

have secured by the cession of a portion of their leases (which they have been unable to develop) to a newly formed company, Katuma Mining Ltd., for a cash payment of £50,000 together with certain participation rights in the event of the new company proceeding to develop these leases. Beyond this the Board has made approaches to the Tanganyika Government and to certain financial groups with a view to making provision for the remaining £350,000, and it is understood that further information on this point may be available at the time of the annual general meeting to be held at Mpanda on October 21.

Meanwhile, so far as we are aware, the repayment of the M.S.A. loan is due to commence next July and be completed in three years in the form of deliveries of concentrates at prices substantially below those ruling at the time when the loan was negotiated, and it seems likely that given a mill throughput of 1,000 tons per day and no improvement in the lead price, it may take at least a quarter of this amount to repay the M.S.A. loan between January, 1955, and June, 1957, leaving only three quarters to meet operating costs and other charges.

### Kramat Pulai Pays Same on Lower Profits

The decline in the net profit of Kramat Pulai during the year ended March 31 last was due both to an increase of £2,534 in the cost of the mine staff pension fund and a decrease of £10,931 in the profit on the sale of scheelite.

Year to Mar. 31	Production Tin (Concs) (tons)	CaWO <sub>4</sub> (tons)	Working Profit £	Tax- ation £	Net Profit £	Divi- dend %	Carry Forward £
1953	188	11.6	13,418	7,698	5,670	6d.	32,393
1952	192	12.4	29,688	17,207	12,964	6d.	32,223
1951	275	9.2	24,329	13,622	10,422	6d.	24,509

In this latter connection the chairman, Mr. E. V. Pearce in his annual statement, said that the decrease in the scheelite price by £400 to £1,388 per ton together with the fact that while scheelite production was only 0.8 tons less than in the preceding year, sales during the period under review only amounted to approximately 9½ tons whereas in 1952 sales increased by 1½ tons over the production figure to roughly 14 tons.

Nevertheless, the company was able to maintain its dividend at 6d. per 3d. share on the £5,000 issued capital and to leave a slightly larger forward balance than in the preceding year.

Mr. E. V. Pearce is chairman. Meeting, London, October 12.

### Naraguta Tin Mines Surprise

Following the publication of the report and accounts of Naraguta Tin Mines Ltd. for the year to December 31 last (see *Mining Journal* September 18, p. 340), shareholders have been given notice of additional ordinary resolutions to come before the annual meeting proposing that Mr. C. W. Loch and Mr. H. G. Hall should be appointed to the Board. (These gentlemen are, we believe, each associated with one or more companies in the Parrish group, which includes among its interests Ashanti-Obuasi Reefs, El Oro Mining and Exploration, Star Explorations, Silvermines Lead and Zinc, and others.) Accompanying this announcement is a circular from the directors pointing out that these resolutions have been put forward unaccompanied by any indication as to whether the intention of the resolution is that these gentlemen should replace the two directors who retire by rotation, and who are offering themselves for re-election (Mr. Herbert T. Skipp, chairman of the company, and Mr. Homfray Ogle), or whether the intention is that shareholders should be asked to increase the number of directors to five, provision for which exists in the articles of association. In either event, the proposal is strongly opposed by the present board—on the first supposition on grounds of the need for continuity of management at a time of some difficulty in the affairs of the tin industry, and on the latter supposition on grounds of economy.

We learn, as we go to press, that the signatories to the resolution may shortly be circularizing shareholders putting forward their reasons for proposing these Board changes. So far as we can ascertain they are opposing the re-election of the retiring directors and urging a more liberal dividend policy coupled with a maximum realization of the company's columbite resources. Shareholders will no doubt be the best judges of a policy of increased profit distribution with the tin price as low as it is now, and with no certainty that the exceptionally high prices for columbite at present offered by the U.S. government will extend beyond 1956. The annual meeting has been convened for 2.30 p.m. on October 21 at Winchester House, Old Broad Street, London, E.C.2.



## LONDON TIN CORPORATION

### CHAIRMAN'S SPEECH

The twenty-seventh annual general meeting of London Tin Corporation Ltd. was held on October 6 at The Chartered Insurance Institute, 20 Aldermanbury, London, E.C.

Mr. J. Ivan Spens, O.B.E., chairman of the corporation, who presided, said:

### ACCOUNTS

The profit for the year before taxation is £1,358,893, compared with the previous twelve months of £1,139,577, an increase of £219,316. Taxation, however, takes £910,000 this year against £723,070 last year, an increase of £186,930, so that our net profit after taxation comes out at only £32,386 above last year. The excess profits levy for the year is estimated at £170,000 as against £40,000 for the four months of the previous year to which this tax applied. Further appeals to the Board of Inland Revenue against the basis on which this corporation is assessed for E.P.L. were unsuccessful. This corporation has since its inception passed through many difficult years, including the years of the war when the Japanese were in occupation of Malaya, where two-thirds of the corporation's interests are situated, and when no dividends were paid.

The Malayan companies were still rehabilitating during the years 1947, 48, and 49 and it was not until 1950 that dividends again began to flow.

The Finance Act, 1952, gave a certain measure of relief to companies whose business was in territory occupied by the Japanese during the war years, by bringing in the year 1950 for calculation of the standard of profit and also by applying an overriding limit of 10 per cent for companies operating overseas instead of the 15 per cent limit for other companies. The Revenue, however, would not allow the corporation to have the benefit of any of these concessions although the corporation's profits arise almost wholly from companies operating overseas. There can be no regrets that this unfair and burdensome tax is to be withdrawn at the end of 1953.

Your directors on reviewing the provisional results of the year's working considered that it would be in the interests of shareholders if the profits were distributed as early as possible after the end of the corporation's financial year instead of as in recent years by declaring an interim dividend in May and re-commencing a final dividend payable after the accounts had been passed. To this end they declared an interim dividend of 22 per cent, and do not recommend any further dividend for the year under review.

### PRICE OF TIN

What is needed in the tin industry, by the producer and consumer, is a reasonably stable price. Violent fluctuations in the price are embarrassing to everyone concerned and cause uncertainties which make economic planning most difficult. Also what is needed by both producer and consumer is an industry which is working on a sound basis, a basis which the producer finds remunerative and which encourages him fully to meet the market's requirements and to plan and make provision for the continuity of production at a level which will satisfy any demands made. It is to this end that it has been decided to reconvene the International Commodity Conference held in Geneva under the auspices of the United Nations in 1950 and which was adjourned.

It must be borne in mind that in the tin industry there is special need for large reserves of money to be held by producing companies. In Malaya and Siam the area on which a dredge works has only a fixed life. To find new areas needs continuous and large-scale prospecting as and when conditions permit. This prospecting is done for us by Anglo-Malayan Development Ltd. in which company this corporation and the producing companies which are under the management of your subsidiary, Anglo-Oriental (Malaya) Ltd., who supervise its activities, are interested.

Any dredge being moved to a new area has to be dismantled, transported and re-erected on its new site and more often than not requires considerable alteration during re-erection to make it suitable for the new area. This work now costs some three to four times the pre-war figure. The finance for all this must be accumulated over the years and unless this can be done there can be no continuity in the production of tin.

The problem in Nigeria is similar. The grade of ground available is declining and the ground itself is becoming more difficult to work. To meet these conditions new and high costing plant has to be ordered and consequently reserves of cash must continuously be built up.

## MALAYA

Conditions in Malaya continued to improve during the year. There is still the threat of a large number of well-armed bandits in the jungles but shooting incidents have become fewer and the number of bandits accounted for has increased. There remains, however, for the staffs on the mines every need to ensure that they and the valuable mining equipment in their charge are adequately protected and I am glad to say that during the year our staff, European and Asian, suffered no fatal casualties and there was no damage to plant or equipment. Malaya during the period under review maintained production at the previous level and to this extent Communist activities have failed in their object to disorganize industry. The output of the mines under the management of Anglo-Oriental (Malaya) Ltd. was 16,636 tons of concentrates as compared with 17,588 in the previous 12-monthly period, but this reduction was due to the fact that six dredges worked out their areas during the year whereas only one dredge started up after transfer to a new area.

Of these six dredges three are being re-erected on new areas and three are waiting the acquisition of new areas. Prospecting has, as shareholders are aware, been almost completely in abeyance due to the security position, but the High Commissioner has recently offered special protection in certain areas so that a resumption of prospecting work can be made. It must necessarily be some time before results are obtained.

I advised shareholders in my speech last year that a large number of war damage compensation claims had been agreed and that 75 per cent of the awards had been paid. It is disappointing that the balance of these claims, which I understand will be about 15 per cent, has not yet been settled, but there is reason to believe that the final settlement may take place in the not too distant future.

I am happy to report that after a recent inspection of a number of the mines under Anglo-Oriental Malaya's management Anglo-Oriental Malaya were congratulated on the excellent arrangements made on the mines for the welfare of the staffs, both European and Asian.

## SIAM

Two of the dredges situated in Siam have now worked out their areas and are in course of transfer to new properties. One other dredge which has not been in operation since the war is in course of rehabilitation and it is hoped will be ready to run trials by the end of 1953.

## BURMA

Conditions of unrest in Lower Burma where the mines of Tavoy Tin Dredging Corporation Ltd. are situated are still such that any mining activities are out of the question and European staff are not permitted by the Government of Burma to visit the mines.

The Burma Government has quite lately called a meeting of the tin-producing companies in Burma and proposed that they should be formed into a joint venture with Government. The implications of this suggestion are not yet clear, but are being carefully studied.

## NIGERIA

Production of tin concentrates from the mines managed by A. O. Nigeria Ltd. remained on the level at which the mines have been running now for some years and which is the level of their most economic production. Columbite output increased from 310 tons in 1951 to 604 tons in 1952, equivalent to some 39 per cent of the world's total production. The 100 per cent bonus on the price for columbite which has been offered by the Government of the U.S.A. until 1956 or until their stockpile is completed, is acting as a stimulant to production and every effort is being made to find new sources of supply. Considerable quantities of columbite ore have been found in the biotite granite of the plateau in Nigeria and Keffi Tin Company Ltd., a wholly owned subsidiary of Amalgamated Tin Mines of Nigeria Ltd., is now working on this and has lately commenced production.

Political conditions in Nigeria have been most difficult but it is hoped that the recent conference between the Secretary of State for the Colonies and representatives of the Nigerian political parties will stabilize the position and that the machinery of Government will run more smoothly.

## NYASALAND

This corporation has formed a locally registered company, London Nyasaland Mining Corporation, Ltd., to prospect for minerals in that country. Government geological reports have indicated mineralization in certain areas but it is too early yet to say whether they can be worked economically.

## GENERAL PROSPECTING

The lead-zinc deposits in Nigeria to which I referred in my speech last year have been further prospected and results have convinced us that further expenditure would be unjustified and the staff and plant have therefore been withdrawn. In the Solomon Islands, as a result of previous reports, a further expedition is now re-examining one of the properties over which a prospecting licence has been granted.

## STAFF

I would like to take this opportunity which the annual general meeting gives to thank the managements and staffs of all our management subsidiaries and to say how much we appreciate their loyal co-operation and work. We have with us to-day Mr. D. T. Waring, the chairman of Anglo-Oriental (Malaya), Ltd., and I welcome him to this the first annual general meeting which he has attended as a director of this corporation.

The report and accounts for the year ended April 30, 1953, were adopted and the retiring directors re-elected.

## September Rand Returns

Despite a rise of 11d. in the gold price basis adopted by the Transvaal Chamber of Mines for September, results show little improvement. The Gold Fields group alone is showing a higher cumulative profit on the year to date, compared with a year ago and this is due mainly to West Driefontein's better showing. The month's results are as follows, with gold valued at 247s. 10d. per oz.:

Company	September, 1953			Current Financial Year			Last Financial Year		
	Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)
<b>Gold Fields</b>									
Libanon	82	16,806	42.7	250	50,770	127.4	249	49,806	128.1
Luipaards Vlei	103	19,060	39.7	319	59,114	126.9	309	58,205	156.4
Rietfontein	27	6,005	24.8	240	53,598	227.1	243	54,124	248.6
Robinson	98	19,355	13.7	881	170,912	118.1	1014	166,451	107.7
Simmer & Jack	125	19,909	13.2	1098	77,740	115.0	1113	177,452	144.5
Sub Nigel	66	22,178	104.7	200	66,567	311.6	201	69,791	371.3
Venterspost	105	24,465	56.9	313	73,189	168.5	313	71,465	188.7
Vlakfontein	38	13,680	74.4	330	119,968	643.0	335	124,536	712.2
Vogels	100	25,000	103.3	873	220,622	886.9	716	187,133	727.8
West Drief.	45	32,588	261.6	132	92,426	745.2	76	44,255	306.4
<b>Anglo American*</b>									
Brakpan	114	20,400	23.8	1032	184,741	200.1	1055	190,688	329.5
Daggas	214	50,143	314.2	1970	464,324	2982.3	2098	499,815	3536.7
East Daggas	95	16,287	49.5	819	142,324	436.6	867	154,782	570.7
S. A. Lands	100	18,376	52.4	900	164,122	461.8	997	179,748	637.4
Spring	143	19,581	9.6	1324	182,158	94.7	1484	194,537	172.2
Welkom	65	12,430	3.0	561	109,547	110.3	440	74,687	L 51.5
Western Hlds.	39	10,491	15.0	109	28,554	30.0	—	—	—
W. Reef Ex.	111	22,329	77.1	979	200,427	720.4	1009	210,714	928.4
<b>Central Mining</b>									
Blyvoor	100	59,109	489.5	306	181,172	1504.1	323	195,524	1711.1
City Deep	154	30,425	18.2	1426	276,583	196.2	1378	279,421	231.8
Consol M. R.	167	23,035	19.2	519	71,288	58.6	555	77,022	91.6
Crown	285	44,266	50.7	2429	386,086	361.9	2417	389,923	349.9
D. Roodepoort	177	29,052	50.3	1605	270,223	581.7	1626	279,192	761.9
East Rand Prop.	189	42,527	119.5	1701	375,407	985.2	1861	399,551	1322.1
Modder B.	53	5,812	2.4	489	52,229	15.0	509	56,158	58.7
Modder East	114	12,880	14.9	356	40,087	46.5	359	41,226	74.3
Rose Deep	70	10,738	10.2	658	97,982	74.5	749	104,131	91.3
Welgedacht	34	4,175	3.0	103	12,746	10.5	103	12,520	13.4
<b>J.C.I.*</b>									
E. Champ D'Or	24	—	L 3.0	218	34,417	3.7	274	41,627	74.5
Freddies North	27	4,252	L24.8	74	11,424	L 71.7	—	—	—
Freddies South	23	4,006	L20.8	84	14,414	L 55.6	—	—	—
Govt. G.M.A.	249	32,188	40.0	2203	298,685	480.6	2193	288,782	450.2
New State	19	2,874	1.1	257	39,095	9.1	408	56,924	9.2
Randfontein	300	38,180	25.0	2753	352,085	242.0	3160	374,445	265.9
Wit Gold	27	3,643	L 4.7	462	51,712	L 78.9	538	64,064	22.3
<b>Union</b>									
East Geduld	133	40,234	299.8	1222	366,933	2733.5	1306	391,843	3104.0
Geduld Prop.	92	14,873	29.7	855	135,576	288.1	944	136,968	317.5
Grootvlei	185	39,312	229.5	1663	354,445	2084.4	1747	378,490	2430.1
Marievale	63	15,282	65.8	563	137,526	596.7	546	136,975	637.1
St. Helena	69	14,130	31.1	576	115,434	197.1	430	84,963	47.6
Van Dyk	83	14,071	2.3	788	127,937	8.5	958	138,822	111.3
<b>General Mining*</b>									
S. Roodepoort	27	5,939	20.1	84	18,088	61.0	83	18,578	70.5
W. Rand Cons.	210	28,647	72.8	2003	279,435	788.6	1922	298,533	1112.9
<b>Anglo Transvaal*</b>									
N. Klerksdorp	11	1,385	L 0.9	94	12,756	5.8	101	11,396	9.2
Rand Leases	163	27,551	15.2	485	82,697	41.7	555	92,561	197.6
Village M. R.	34	5,273	12.0	102	15,912	36.0	101	15,868	44.8
<b>Others</b>									
N. Kleinfontein	107	13,718	22.5	963	124,441	232.5	958	125,920	579.8
Spaarwater	11	2,401	L 2.7	93	21,415	L 28.7	94	21,349	L 24.3
Stilfontein	68	20,745	108.2	569	165,063	813.9	—	—	—
W. Nigel	17	3,880	8.1	51	11,588	22.4	50	—	21.5

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (\*) profit includes sundry revenue. Profit figures preceded by L indicates a loss. † Excluding development expenditure.

## HARMONY GOLD MINING CO., LTD.

(Incorporated in the Union of South Africa)

AUTHORIZED CAPITAL (in shares of 5s. each) .. £3,750,000  
ISSUED CAPITAL .. £3,400,000

## REPORT AND ACCOUNTS FOR YEAR ENDED 30th JUNE, 1953

Summarized Receipts and Expenditure	
Net Capital Receipts	£7,043,074
Expenditure	6,409,694
Less Shares, Stores and Materials, Debtors, etc.	633,380
Net Cash Position	£101,408

## EXTRACT FROM DIRECTORS' REPORT

General Comments on the Position at the Mine.—The Ventilation Shaft reached its final depth of 4,729 ft. during November, 1952. Since then the main station on 6 level, the necessary ore and waste passes and the ancillary cross-cutting required to service the shaft have been completed, and the shaft has been equipped to hoist men, material and ore. The main haulage on 6 level and a winze from this level to connect with No. 3 Shaft 4,300 ft. to the west had been advanced 2,268 ft. and 383 ft. respectively by the end of the financial year. A raise from 6 level towards the eastern boundary of the property had been advanced 407 ft., 6 level drive north 250 ft., and 6 level drive south 564 ft. Of the 1,604 ft. of development on the Basal Reef Horizon accomplished by the 30th June, 1953, 1,505 ft. were sampled and 1,280 ft., or 85 per cent., proved payable averaging 16.6 dwt. over a channel width of 44 in., equal to 729 in.-dwt. As the stopes which will provide the ore during the initial stages of production will be situated in the vicinity of the Ventilation Shaft, these values, taken in conjunction with the Ventilation Shaft and H.1 Borehole intersections averaging 629 and 1,031 in.-dwt. respectively, the robust nature of the reef and the favourable indications of mining conditions, are encouraging. Progress in No. 3 Shaft was retarded due to the presence of water-bearing fissures which required cementation and the rate of advance averaged only 90 ft. per month during the year. Since the end of June, as has been announced, the Lead at No. 3 Shaft was 55 in. at a depth of 4,865 ft. with low gold value, and the Basal Reef at 4,916 ft. The Basal Reef was stopped out for a distance of approximately 15 ft. round the shaft (as was done in the case of the Ventilation Shaft) to facilitate the early removal of the ore adjacent to the shaft. Sampling at 5 ft. intervals round the perimeter of the original shaft intersection and of the stoped out area gave an average value of 5.8 dwt. over a channel width of 63 in., equal to 363 in.-dwt. The dip of the reef at No. 3 shaft was 5° in a westerly direction compared with the dip of 9° to the west encountered at the Ventilation Shaft. At a point some 6,300 ft. to the north-west of No. 3 Shaft borehole L.R.8 was drilled to test the proposed site for No. 2 Shaft which it is intended to sink at some later date. The Basal Reef was intersected at the anticipated depth of a little over 5,000 ft., and in spite of some loss of core due to grinding the assay results of the original intersection and three deflections averaged 1,671 in.-dwt. Higher up in the formation, however, from about 3,900 to 3,500 ft. below surface, some disturbed ground was encountered which indicated that a shaft on this site would encounter difficult sinking conditions and a further borehole, L.R.9, some 1,500 ft. to the east of L.R.8 is being drilled to try to locate a more suitable site for the proposed shaft. Steady progress continues to be made on construction on the surface. By the 30th June, 1953, 62 temporary and 161 permanent houses for European employees had been completed and 73 permanent houses were under construction; accommodation for 1,580 Non-Europeans had been completed and extensions to house a further 768 were in course of erection; and in addition to the many buildings already completed, the boiler-makers' shop, assay office, store, change houses and sundry other buildings were in course of construction. Satisfactory progress has been made on the first 45,000 ton unit of the reduction plant and the construction of the uranium plant has been commenced.

Uranium.—In a Press announcement on 15th January, 1953, shareholders were informed that by arrangement with the Atomic Energy Board of South Africa, the Company would proceed at once with the erection of a plant for the extraction of uranium from the residue slimes of its gold production plant. The Directors' borrowing powers were accordingly increased from £2,000,000 to £6,000,000 at an Extraordinary General Meeting of the Company held on 31st July, 1953. The contract with the Atomic Energy Board is for a period of ten years and arrangements have been made with the Export-Import Bank of Washington and the United Kingdom Ministry of Supply for loans to meet the capital cost of the treatment plant, estimated to be of the order of £3,300,000, such loans being repayable over the period of the contract. The price payable for the uranium produced will be related to the cost of production on a basis that will ensure the redemption of the capital cost of the plant, together with interest, over the ten-year period of the contract and will provide a satisfactory margin of profit. The Company will pay the State as lease consideration a proportion of its profits from uranium on the same scale as will be payable in terms of the gold mining lease and taxation will be payable on such profits at the rate applicable to gold mining companies. As will be seen in the Balance Sheet, the Company expended an amount of £68,873 during the financial year in connection with the uranium plant. This sum together with the amount spent since 30th June, 1953, has recently been drawn against the aforementioned loan facilities.

Finance.—As the capital funds raised in March, 1952, were exhausted shortly after the end of the financial year under review, temporary unsecured loan facilities of up to £900,000 were arranged as from 1st August, 1953, with The Central Mining & Investment Corporation Limited and Rand Mines, Limited. The loan carries interest at the rate of 5½ per cent. per annum plus a raising fee of ½ per cent. and is repayable by 30th November, 1953. Amounts are being drawn as and when required from these funds which should be sufficient to finance operations until such time as the necessary finance has been provided to bring the mine to production during the latter part of 1954. A Meeting has accordingly been convened for 25th September, 1953, to recommend to shareholders that the Authorized Capital of the Company be increased from £3,750,000 to £4,500,000 divided into 18,000,000 shares of 5s. each by the creation of 3,000,000 new shares and that the Directors be empowered to issue up to 4,400,000 shares upon such terms as they may determine. In the event of the resolution being passed, it is intended to make a simultaneous offer of shares and registered unsecured convertible notes during November, 1953.

The full Report and Accounts may be obtained from the London Secretaries, A. Moir & Co., 4 London Wall Buildings, London, E.C.2. The resolutions referred to above, were duly passed at the Extraordinary General Meeting on 25th September, 1953.

## HARMONY GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa.)

In the course of his address at the Extraordinary General Meeting of the Company, held on September 25 for the purpose of sanctioning an increase in the Authorized Capital, **Mr. P. H. Anderson**, the Chairman, said:—

Of 19 boreholes sunk on or adjacent to the company's property three intersected reefs published as "Leader Basal Reef" averaging 403 in. dwt. and 14 intersected the Basal Reef proper, averaging 666 in. dwt. Two shafts have been sunk on the property. In the ventilation shaft the average in. dwt. value on the Basal Reef was 629 and in No. 3 shaft 365. The development work now in progress consists of, firstly, making connections between these two shafts and, secondly, establishing stope faces in the area adjacent to the ventilation shaft. To connect the shafts, which are 4,300 ft. apart, a main haulage on the 6th level and also a winze from the 6th level are being driven. At the end of August these had been advanced 3,143 ft. and 1,034 ft. respectively, and it is expected that the main haulage will hole during November. The development work in connection with establishing stope faces is also pregressing satisfactorily. 1,696 ft. have been advanced north and south on 6 level reef drive. One raise from this level has been advanced 937 ft., a second raise 21 ft., and a third raise is about to commence; these raises are about 800 ft. apart. The necessary footwall cross-cutting and box-hole-raising required to handle the broken ore from the stoping area is in hand. Up to the end of August 1953, 3,787 ft. had been advanced on the Basal Reef horizon and of this 3,560 ft. had been sampled, 3,250 ft., or 91.3 per cent, proving payable, averaging 15.4 dwt. over a channel width of 44 in. equal to 678 in. dwt. The values disclosed by underground development thus confirm the promising prospects indicated by the boreholes. In addition to the encouraging values obtained, and the robust nature of the reef, the indications of actual mining conditions in the Ventilation Shaft area are favourable in that to date only a few minor faults have been intercepted and the amount of water encountered has been small.

On the surface steady progress continues to be made with the construction of the necessary housing, offices, workshops, stores, sundry other buildings and the first 45,000 ton unit of the reduction plant. The company has been accepted as a uranium producer and the erection of a plant to handle the residue slimes from the first two units of the gold production plant has commenced. It is expected that gold production will start early in the latter half of 1954 and that uranium production will commence shortly thereafter.

The capital funds raised by the second tranche of capital in 1952 were exhausted during August of this year, since when the company has been operating on temporary unsecured loan facilities of up to £900,000 made available by the Central Mining and Investment Corporation Limited and Rand Mines, Limited. It is expected that these funds will be sufficient to carry the company through to the early part of November this year.

It is accordingly necessary to make further financial arrangements in order to liquidate these loans and to provide the capital required to bring the mine to production. Your directors have given careful consideration to this question and have decided to recommend to shareholders that such funds be raised by a simultaneous offer of shares and registered unsecured convertible notes during November, 1953. It is intended to raise approximately £4,100,000 by this means and it is estimated that this will be sufficient to repay the loans and to meet capital expenditure until the end of 1954.

The proceedings then terminated.

*Since the holding of the Extraordinary General Meeting, the London Secretaries of Harmony Gold Mining Company Ltd. have issued the following circular to shareholders:*

Further to the Circular to Shareholders and accompanying Notice of Meeting, dated 2nd September, 1953, the resolutions contained therein were duly passed at the Extraordinary General Meeting of the Company held in Johannesburg on 25th September, 1953.

Shareholders are aware that it is intended to raise approximately £4,100,000 by the simultaneous offer of new shares and unsecured convertible notes. As in the previous issue of shares, the Board has decided to offer the proportion of new shares and convertible notes which would otherwise have been available to Central Mining Free State Areas Limited and New Consolidated, Free State, Exploration Company Limited by reason of their shareholdings in this Company, for direct subscription

by the shareholders of those companies. This decision will not, of course, affect the rights of other shareholders to participate in this offer.

The Transfer Books and Register of Members of this Company will be closed from 20th October, 1953, to 26th October, 1953, both days inclusive, for the purpose of the offer, which will be made to shareholders (other than Central Mining Free State Areas Limited and New Consolidated, Free State, Exploration Company Limited) registered at the close of business on 19th October, 1953.

A circular giving full details of the proposed offer will be posted to shareholders on 16th October, 1953, and the Annual Report for the year ended 30th June, 1953, will be issued about the same time.

Shareholders expecting to be absent from their registered addresses during November, 1953, are advised to arrange for some other person to deal with the offer on their behalf.

## Company Shorts

**North Broken Hill Cuts Final Dividend.**—Preliminary figures, covering the period to June 30 last, show that North Broken Hill's profit for the year was down by nearly £1,000,000 at £1,600,058 (£2,566,171), after providing £349,000 (£1,925,000) for taxation and royalty payments and £100,000 (same) for depreciation. Out of the year's profits £1,050,000 is to be appropriated for plant and mine development, about the same as last year, while a final dividend of 50 per cent has been declared making 90 per cent for the year on the 5s. stock units compared with 170 per cent in the two preceding years.

**British Tin Investments E.P.L. Liability in 1952.**—British Tin Investment Corporation has announced a second interim dividend of 7 per cent payable on October 10 to shareholders registered on September 14. In making this announcement the Corporation added that its E.P.L. liability for 1952 has been provisionally agreed with the Inland Revenue in accordance with the 1953 Finance Act and that it will be covered by a provision of £16,500 compared with £106,000 set aside in the accounts for that year.

**Kamunting Tin Maintains Dividend on Reduced Profit.**—Despite a reduction in profit before tax for the year ending March 31, 1953, of £180,000 at £600,815 (£780,922) Kamunting Tin Dredging recommend the payment of a final dividend of 27½ per cent which together with the interim dividend already paid makes the total distribution for the year unchanged from the preceding year at 40 per cent. The reduction in profit has been virtually offset by a corresponding reduction in provision for taxation which this year requires £345,000 (£520,000).

**"Satmar" Makes Bonus Payment.**—Preliminary figures for the financial year ending June 25 last show that the South African Torbanite Mining and Refining Company improved their profit before tax for the year at £153,646 (£112,116). £10,000 of this increase is absorbed in additional provision for taxation which stands at £50,000. A dividend of 6d. per share, plus a bonus of 1½d. per share is recommended making 12½ per cent for the year against 10 per cent last year and 12½ per cent for the year before.

**De Beers Interim Maintained at 80 Per Cent.**—De Beers Consolidated Mines has announced an interim dividend of 80 per cent on the £4,080,407 Deferred capital in respect of the year ending December 31 next. This payment is the same as was made a year ago when the total annual distribution of 200 per cent was made up by a final declaration of 120 per cent.

**Harmony Gold Mining Company's** annual general meeting was held in Johannesburg on November 6. An extract from the directors' report appears on the opposite page.

**Transfer Facilities for Aluminium Limited** are now available at the office of Morgan Grenfell and Co. Ltd., 23 Great Winchester Street, London, E.C.2.

**Mr. G. A. Smith** has been appointed a director of Beralit Tin and Wolfram. He has been the company's general manager in Portugal since 1934.

**Mining and Chemical Products Ltd.** have moved to new offices at Cecil Chambers, 86 Strand, London, W.C.2.

**Death of William Watson.**—It is with regret that we record the death last Sunday of Mr. William Watson after a long illness. Mr. Watson was the founder of Safety Products Ltd. and did very great work for industrial eye protection in this country.



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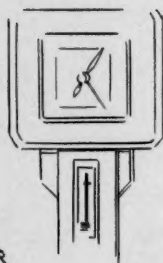
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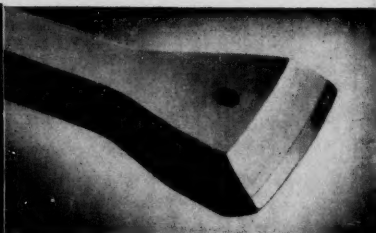


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